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REFERENCES AND ABBREVIATIONS

Readers in search of a given subject will find it useful to bear in mind that the references are in several cases distributed under two or more separate but nearly synonymous headings—such, for instance, as Brain and Cerebral, Heart and Cardiac, Liver and Hepatic, Child and Infant, Goitre and Thyroid, Diabetes, Glycosuria and Sugar, Eye, Ophthalmic, and Vision, Lunacy and Mental Disease, Arsenobenzol and Salvarsan, &c., &c., and that regional headings are more frequently used than pathological. Institutions and Corporations with the right to the prefix Royal will be found under that prefix, with the exception of Hospitals, which will be found under that heading; and Medical Societies, which are separately indexed under Societies. All Universities are indexed under the word University. (A.) = Annotation, (C.) = Correspondence, (N.I.) = New Inventions, (L.A.) = Leading Article, (M.L.) = Medico-legal, (M.T.T.) = Modern Technique in Treatment, (O.) = Obituary, (P.I.) = Parliamentary Intelligence, (R.) = Review, (R. and A.R.) = Reports and Analytical Records, (A.D.) = Clinical Interpretation of Aids to Diagnosis, and (N.P.) = New Preparations.

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Purvis Oration

ENTITLED

THE DUMPING GROUND OF NEURASTHENIA.

Delivered before the West Kent Medico-Chirurgical Society on Dec. 13th, 1929,

BY SIR E. FARQUHAR BUZZARD, BT., K.C.V.O., M.D. OXON., F.R.C.P. LOND.,

CONSULTING PHYSICIAN TO ST. THOMAS'S HOSPITAL; REGIUS PROFESSOR OF MEDICINE IN THE UNIVERSITY OF OXFORD.

TAKEN as a whole we doctors carry on our trade in an honourable fashion and are imbued with a genuine desire to cheat neither our clients nor ourselves; but it can hardly be denied that the label of neurasthenia is often used in order to evade a duty—the duty imposed on us to declare a correct diagnosis. Whether such action should be regarded as a crime or only as a pardonable misdemeanour is a moral question I do not propose to discuss; the object of my discourse is to show that it is not good business.

The label of neurasthenia is a bad business proposition for two reasons. In the first place it conveys little or no pathological meaning to your own mind; in the second place it gives your patient the impression that he is suffering from a disease the cause, course, and outcome of which are equally mysterious to both of you. "Then, it is only nerves?" he will say to you. And you won't know what answer to give. Whether it is yes or no or a compromise, it is given with a hesitancy which can only add to the patient's depression and must eventually lead to loss of confidence. And that is bad business because, contrary to what is generally supposed and to what might be expected, we are not really judged so much by the results of our treatment, which is fortunate, but by our knowledge and understanding of our patients and their illnesses. The quack must perforce depend on his ability to cure and, therefore, always and inevitably fails in the long run to keep the position he attains by means of a wealth of promise and a poverty of knowledge. *We* must rely on our ability to detect the origin of an illness, on our acquaintance with its natural progress and natural result, and on our experience of how these may be influenced by treatment, if we are to preserve our rôle of trusted guide, rather than that of healer, in times of trouble. This is an axiom which holds good in all fields of medicine, but which has peculiar difficulties as well as outstanding importance in its application to the handling of neuroses or functional nervous disorders.

It is to these difficulties and the mode of their origin that attention must be drawn if an attempt to tidy up the dumping-ground of neurasthenia is to meet with any success.

NATURE OF FUNCTIONAL DISORDERS.

Thirty years ago those interested in disorders of the nervous system were chiefly concerned with the study of structural changes as revealed in the human body after death, and with the determination of physical signs denoting the presence of such structural changes during life. Disorders of the nervous system at that time were either organic or functional, and in order to decide to which category a particular disorder belonged it was only considered necessary to determine the presence or absence of organic signs. In the absence of organic signs the condition was regarded as functional, and little further interest was taken in its pathology. The literature of the period I refer to is full of dissertations on the value of various signs of organic disease revealed during the examination of patients, especially in relation to the reflexes, and the work which was carried out was of great and lasting importance. Since that time, however, considerable advances have been made in neurology, in psychopathology, in endocrinology, in bacteriology, and in other branches of medicine, many of which bear upon the *nature* of functional nervous disorders and therefore upon their treatment.

In neurology, for instance, we are no longer altogether dependent on the presence of physical signs for a diagnosis of organic disease. We recognise disorders of function, as revealed by a patient's complaints, as equally good evidence of organic disease, and we rely therefore on our ability to discriminate between symptoms which suggest organic disease and those which suggest disorders of mind, disorders. [illegible] that term in preference to that of "functional much attention and give much time [illegible] obliged to pay of patients and to cultivate the arts of listening and of cross-examination. In other words, we have come to study illnesses in longitudinal section more than in cross-section as was the custom at an earlier period. The same trend has been manifest in the domain of psychopathology where Freud, using the historical or longitudinal method of investigation, has led the way in exposing the source and development of many disorders of the mind, thus throwing much-needed light on the causal factors underlying the neuroses and psychoneuroses. Although we may not be ready to support the Freudian school in all its contentions and conclusions, there can be no doubt that we owe it a great debt of gratitude for clearing up many obscurities, and not least, and this as you will see has much bearing on my subject for to-night, for enabling us to distinguish between those mental disorders which are amenable to psychotherapy and those which are not. The importance of this step in dealing with the group of cases labelled "neurasthenia" is difficult to exaggerate.

As a natural corollary to what is sometimes termed the new psychopathology the physician can no longer be content with a diagnosis of functional disorder based on the absence of signs or symptoms of organic disease. He must go further, as he would in a case of organic disease, and endeavour to establish its pathology: in other words, to trace the morbid process back to its causal origin. That this quest is often difficult and sometimes unsuccessful, as in organic disease, does not absolve him from its pursuit, and, whatever the result, the process is likely to promote that favourable atmosphere of confidence between doctor and patient so essential for any therapeutic measures that may follow.

CLINICAL LIMITATIONS OF BIOCHEMISTRY.

Although it cannot be doubted that the obscurity of neurasthenic problems has been lightened by the advances in neurology and psychopathology I have referred to, the same cannot be stated with equal truth in regard to other branches of medicine such as endocrinology and bacteriology. On the contrary, Freudian doctrines have produced a reaction in the minds of many medical men which has taken the form of a desire to ascribe all mental disorders, including neurasthenia, to some physical or chemical agent the result of disturbed glandular secretions, of septic tonsils or teeth, of intestinal stasis or infection, or of a blood pressure which is too high or too low. In accepting such theories the post hoc propter hoc argument has been utilised with little critical judgment and the frequency with which all these morbid conditions are found unassociated with mental disorders has not been given sufficient weight. On the other hand, it has been often demonstrated that when the removal of teeth, tonsils, or an appendix has failed to cure an anxiety neurosis an attack on the position through psychological channels has brought complete and lasting relief. While it is the duty of a doctor in attendance on a neurasthenic patient to look after his or her physical health, he is guilty of culpable negligence if he overlooks or ignores the mental factors to which the patient's miserable condition is primarily due. This is a subject on which it is difficult the interests of the patient but because a doctor's credit or discredit often hangs on the manner in which he tackles the problem of depression. Many of these patients are of necessity and indeed often better treated in their own homes, provided that they can there obtain all necessary care and attention, but the situation must be clearly explained to their relatives, who must be ready to coöperate with the doctor and to realise the scope and limitations of his treatment. Let me again quote Dr. Ross in this connexion :—

> "Nothing, so far as is known, will shorten the attack, but much can be done to make it safe and comfortable for the patient. . . . It is, moreover, an illness where we must not always expect to gather the fruits of our labour. We may sow and another man reap and obtain much credit which in no way belongs to him. If compensation is necessary to the doctor, he will get it often from some other man's cases. After many months of unwearied attention to a patient suffering from the disease, it often happens that the friends of the patient think a change desirable; they have been told by so many people that this, that, or the other person is the man for such cases, and perhaps soon after the change the long-looked-for cure takes place. But there is an interchange of luck in this respect and the writer has often received credit for the recovery when all that had happened had been that he was the man in attendance at the end. Such undeserved praise or dispraise comes from the friends; the patient always knows better, and there is no class of patient from whom more sincere gratitude is obtained than from a depressive.
>
> "The first essential is that the patient should be under care, and that he should be visited frequently, it may be daily or only every other day. His history should be taken in the same way as was advised for that of the neurasthenic, and the physical condition thoroughly investigated. The patient may be asked whether he has had any anxieties; if he says not, this statement should be accepted without question. It is essential that nothing in the nature of psychological probing should be done to a patient in this group. He will without doubt be a person who is, for the time at any rate, filled with the sense of inferiority, and probing into his past may tend greatly to increase this, and turn a mild case into one of great gravity. Such a procedure may certainly turn a non-suicidal patient into one where the danger is present."

With this grave warning I am entirely in agreement; by itself it forms a strong argument in favour of making a correct diagnosis and an equally potent reason against the use of any form of psycho-analysis in the treatment of the autonomous depressive. It must be remembered that the majority of suicides are committed by these patients and especially by those who suffer from the disease in a moderately severe form. The danger of suicide by a neurasthenic is comparatively negligible in spite of the evidence given in coroners' courts.

For the rest, the treatment of the depressive is largely symptomatic. He is easily tired and certainly made worse by fatigue. His sleep is generally disturbed during a considerable part of his illness and sedative drugs are often indicated and valuable, especially when given in the early hours of the morning, the time at which the patient is inclined to wake and to be at his worst. Light occupation is beneficial but many sufferers are unable to settle down to anything and their restlessness is often distressing.

But perhaps the most important part of the treatment is the daily visit of the medical attendant who must be patiently content to listen every time to the same miserable story and to repeat his assurance that the patient's condition is a well-recognised illness and one which invariably ends in complete recovery. One fine day the doctor may find the patient quite well, the cloud lifted, and peace of mind restored. The recovery is not always so dramatic; it may be gradual and sometimes the cloud may lift for 24 hours and fall again. It is impossible to predict and it is generally wise not to make the attempt.

AN EVERYDAY PROBLEM.

My attack on the Dumping Ground is fading away. It began with the creditable intention of turning over, sifting and criticising everything with neurasthenic pretensions. I am aware that I should have found many oddities of interest in the process. There would have been revealed cases of unsuspected organic disease, of mild encephalitis, and of early general paralysis. Here and there an incipient dementia præcox or a compulsion neurosis might have come to light. But in very truth my objective was to present the differentiation of the anxiety neurosis from the manic-depressive in the plainest colours, and to show that such differentiation is not a matter of mere academic snobbishness but an everyday problem of outstanding importance to all who practice medicine.

An Address

ON THE

CLINICAL APPLICATION OF THE NEWER CONCEPTIONS IN THE PHYSIOLOGY OF THE EYE.

Delivered on receiving the William McKenzie Memorial Medal at Glasgow on Dec. 2nd

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THE development of any science tends to proceed, not with a regular and even current, but intermittently, like a river which in its placid onward course every now and then bursts into life to hurl itself against the rocks and dash itself pell-mell down a cascade. We get periods of intense creative activity wherein new ideas are developed and new theories are evolved, frequently in bewildering confusion and usually half assimilated; and these are followed by periods of relative quietude wherein these new ideas are consolidated—periods, it is true, less dramatic, but nevertheless as useful, wherein the flotsam can be discarded and that which is good and of permanent value can be gathered, assorted, and stored.

I would like to divide a review of the history of ophthalmology into five such periods as these. The first may be said to have culminated in the middle of last century with the great clinician whose memory we are keeping alive to-day. It is difficult to name this period, but perhaps it may justly be called the age of clinical intuition. It is more difficult to realise the handicaps and disabilities under which these early workers laboured, relying entirely upon the evidence of their senses and the lessons of their experience, without any means of detailed clinical examination, without asepsis and with no anæsthetics, with little or no pathological knowledge, with a meagre physiology and with no biochemistry. But when we realise their difficulties we can only marvel at the clinical acumen and profound insight to which the greatest of them attained, which allowed William McKenzie to establish the fact of sympathetic ophthalmitis, to lay his finger on the essential factor in glaucoma, and to write one of the most extraordinary works on ophthalmology in the whole of the world's literature—his "Treatise on the Diseases of the Eye." The second period was born with the ophthalmoscope, and when the inner eye could be directly observed by means of Helmholtz's instrument, ophthalmology became galvanised into an age of activity the like of which it had never seen before. The third period was the age of the microscope, when with the intensive study of pathology that engaged all the clinics of Europe at the end of last century and the beginning of the present one, our knowledge of the gross anatomy of diseases of the eye increased by *leaps and bounds*; it was a period full of memorable achievements, and it yielded a harvest the value of which will stand for all time. When Gullstrand perfected the slit-lamp some 18 years ago, a fourth era was ushered in, when the study of the pathology of the dead gave way to the study of the pathology of the living. Although it is easy to over-estimate its value, it cannot be denied that the greater facilities with which this new method of examination provided the clinician gave an immense impetus to research, and was responsible, and is still, for a mass of clinical observations which, without its aid, would have remained largely academic and divorced from the routine and practice of the clinic.

But I think it must probably be admitted that while the spirit of clinical inquiry is with us always, the ophthalmoscope has told us most of its secrets, the microscope has pictured most of the mysteries to which histology can reach, and even the slit-lamp, although it has not yet expended all its potentialities, can hardly create a new revolution. Man, in his insatiable quest for more and yet more knowledge, is turning to something else. This brings us to the fifth stage in the history of our subject; and I hope that time will show that I am not over-optimistic when I propose to call it the age of physiology and biochemistry.

A NEW POINT OF VIEW.

We all know of the clinical picture presented to us by McKenzie; we have seen the eye through the ophthalmoscope of Helmholtz, the microscope of Bowman, and the slit-lamp of Gullstrand. I want to put before you a further picture; I am going to ask you to look at ophthalmology with the eyes of a chemist and physiologist. I shall ask you to look upon the eye, not as an organ built up of a few component parts—of three outer tunics and three inner humours—but to look within and beyond this picture to something more fundamental, to lose your accustomed sense of magnitudes, and see an infinitude of molecules and atoms, each inordinately busy travelling in its own appointed path, each running within the limits of certain laws, and controlled by complex but unalterable forces: the whole assemblage partitioned off by membranes through which in certain circumstances they may pass, semi-isolated but coördinated, so that they all together comprise a teeming biochemical factory, complete in itself, but at the same time working in harmony with the larger biochemical factory of the body of which it forms a part.

The most fundamental thing which has occurred in biochemistry in recent times is the establishment by Prof. F. G. Donnan of the laws which govern the passage of dissolved substances through membranes. The whole body is divided up into cells, each separated by membranes from its neighbours, and even within the cell itself there is a complexity of potential membranes. All the active constituents of the body are dissolved in watery solution, and hence it follows that all the activity which takes place, and all the means of communication between the individual cell-units, must necessarily resolve itself into a question of the passage of dissolved substances through membranes. The matter, however, is not so simple as at first sight it may appear, for the membranes, as a rule, allow only the smaller molecules to pass through them and keep the larger ones behind. This provides one means of complication. Moreover, we know that each molecule of salt in solution is broken up into two ions, each of which carries an electric charge—the one a positive charge and the other a negative. Since, therefore, a free diffusion of all ions equally is precluded by the semi-permeability of the membranes, this rearrangement and difference in concentration at once involves the development of hydrostatic, osmotic, and electrostatic forces. Stability and equilibrium can only be reached when all these forces are made to balance, the one compensating for the other. It is the interaction and rearrangement of these forces which is necessary to prevent the occurrence of an explosion, as it were, that constitutes a thermo-dynamical equilibrium.

We will see more clearly what is entailed by this conception when we take a specific instance; but I should like to divide the whole of the vegetative physiology of the eye into four such equilibria: (1) The equilibrium between the blood plasma in the capillaries and the intra-ocular fluid. (2) The equilibrium between the intra-ocular fluids and the vitreous body. (3) The equilibrium between the intra-ocular fluids and the lens. (4) The equilibrium between the blood plasma in the chorio-capillaris and the sensory epithelium of the retina.

THE INTRA-OCULAR FLUID.

We will look first of all at the equilibrium between the blood and the intra-ocular fluid, because this is the most fundamental one. By the intra-ocular fluid I mean not only the aqueous humour but also the fluid in the tissue spaces of the eye, in the uveal tract, in the cornea, and in the retina—all the fluid within the sclerotic, in fact, which is not included within the compass of the other three equilibria.

It is through the membrane formed by the capillary wall that all vital changes associated with the interchange between the blood and the tissues take place. We can picture the mechanism by a scheme like the following, where we will presume, for the sake of simplicity, that the blood possesses two kinds of molecules only: large molecules (protein, such as sodium albuminate), the colloid part of which cannot get through the membrane, and smaller molecules which can. Some of the latter are broken up into particles which are ionised and carry an electric charge (salt), and some which, being non-electrolytes, are not thus broken up (sugar). Now when we try to establish connexion across the membrane, the negatively charged albuminate (A) is held back, and with it, for electrostatic reasons, some of the positively charged sodium ions will be retained also. So far as the diffusible ions are concerned (NaCl) Donnan has shown that, in order to attain a state of equilibrium, they must obey certain conditions by which the products of their concentrations are equal on both sides of the membrane. It follows, since there are more positively charged sodium ions in the blood, that there must be more negatively charged chlorine ions in the aqueous humour. The sugar (S) which, not being ionised and carrying no electric charge, is not subject to those electrostatic constraints, is free to distribute itself equally between two fluids. We have, therefore, a definite and well-defined concentration of the various chemical substances, and this concentration involves specific osmotic and electrostatic forces which combine together to equilibriate each other.

Blood.	*Aqueous.*
A^-	
Na^+	
Na^+	Na^+
Cl^-	Cl^-
S	S

Let us pause for a moment to see how actual facts conform to these theoretical considerations. A thorough analysis of the chemical composition of the aqueous humour[1] shows that it contains all the constituents of the blood plasma. The colloids, however, not readily obtaining a passage through the membrane, are present only in traces; the non-electrolised constitutents are present in equal amounts, and the ionised substances are partitioned exactly in the proportion which the postulates of a thermodynamical equilibrium necessitate. I know of few biological relationships where theoretical values are so exactly attained. For example, I have found that while the sugar in the arterial plasma is 0·158 g. per cent. and in venous 0·133 per cent., that in the aqueous is 0·151 g. per cent., which approximates the value which must of necessity be found in the capillaries. Again, to take an ionised substance, the concentrations of normal sodium in the aqueous and in the blood are as 121 : 145, while those of the chlorine similarly expressed are as 123 : 103. We see that the concentration of negatively charged chlorine in the aqueous is the greater, and the concentration of positively charged sodium in the blood is the greater; and when we take the product of the ions of the two fluids, which theoretically should be equal, we arrive at the figure 148·83 = 149·35—an exceedingly close approximation for any biological estimation.

So much for the chemical equilibrium; let us now turn to the physical one. The osmotic pressure of the aqueous humour[2] exactly corresponds to the very precise value necessitated by the peculiar distribution of ions which we have just considered. The differences in electrical charge imply a difference in electrical potential between the two fluids, and if this is measured galvanometrically by inserting one electrode into the jugular vein and the other into the chamber of the eye, this difference is obtained. Again, the hydrostatic pressures in the eye[3]—the pressure in the entering arteries,[4] in the exit veins,[5] and the pressure in the chambers of the eye—are at exactly the correct level.[16]

Moreover, in abnormal conditions changes take place in the aqueous humour exactly in terms of the some equilibrium.[6] An alteration may be brought about by two conditions: first, by altering the permeability of the capillary walls so as to allow more substances through from the blood; and second, by altering the composition of the blood so that different materials are available to pass through. In the first case if the capillary permeability is increased, as by a dilatation of their walls, a greater amount of colloids will get into the eye and thus an albuminous or plasmoid aqueous is formed. Here, since the electrical strain between the two fluids is now lessened, the concentration of the positive ions increases while that of the negatively charged ions diminishes, the osmotic pressure and the electrical potential fall, the concentration of hydrogen ions rises, and the pressure of the eye increases. This always occurs in such a way that a perfect thermodynamical equilibrium is continually maintained no matter how the alteration in capillary permeability is brought about, whether by processes so divergent as a simple paracentesis or an inflammation of the eye. In the alternative case, if the composition of the blood is altered, the constitution of the aqueous humour alters again according to thermodynamical laws. Large-sized molecules injected into the blood even in abnormal concentration will not find their way into the eye except in traces. Thus dyes like trypan blue or congo red do not enter the aqueous humour, and the difficulty of facilitating the entrance of drugs like the large-moleculed organic preparations of arsenic is thus explained. To a large extent this accounts also for the therapeutic value of a paracentesis, which, by increasing the capillary permeability, allows the more ready passage of substances of this nature. Further, if positively charged cations are added to the blood they enter the eye only with difficulty. The basic dyes, as neutral red, methylene-blue, kresyl blue, fuchsin, and others, as well as metallic ions such as sodium, mercury, or bismuth, come under this category. On the other hand, negatively charged anions enter readily, dyes like eosin, chrysolin, orange G. and anions such as iodides, chlorides, bromides, and organic anoidal substances such as salicylic acid. It is evident that what used to be called the "selective permeability" of the ciliary epithelium, and which used to be cited as evidence of its secretory activity, is a purely physical process determined by thermodynamical laws.

On either side of the capillary walls there is, therefore, a balancing thermodynamical equilibrium comprised of complex but well-determined chemical, hydrostatic, osmotic, and electrostatic forces. Around this level the mutual compensating forces are continually fluctuating, and in any capillary they will determine a flow of fluid outwards at one moment and inwards at another, accompanied by a diffusion outwards or inwards of diffusible substances according to their several differences in concentration and determined by the nature of their electric charge, while the whole is subject to a readjustment depending on the colloid impermeabilities. This fluid percolates through all the structures within the sclerotic, through the stroma and the cellular elements of the ocular tissues, through the substance of the cornea, and eventually through the endothelium and epithelium lining the anterior and posterior chambers, filling up these cavities.[7] Throughout its passage across it is modified by metabolic activity and by the stresses to which it is exposed; at all points in its course, between each cell and between the interfaces within each cell, fresh membranes or potential membranes have to be traversed, each involving a new system of forces with the corresponding adjustments which these entail, and each necessitating a fresh state of thermodynamical equilibrium. While this reciprocal interchange occurs throughout all the tissues of the eye, circulatory conditions to a less extent, and the influence of muscular activity to a greater extent, will determine a slow through-and-through circulation of fluid through the chambers of the eye, which will find its exit mainly by way of the canal of Schlemm[8]; while differences of temperature within the anterior chamber itself determines an internal thermal circulation.[6]

THE VITREOUS BODY.

So much for the first equilibrium; we are now in a position to deal more rapidly with the others. The chemical examination of the vitreous body[9] shows that it is made up of all the constituents of the aqueous humour in corresponding proportions with the addition of two specific colloid constituents of ectodermal origin: a mucoprotein and a second protein substance the exact chemical nature of which I have not yet been able to elucidate, and which I am, therefore, in the meantime calling a "residual protein." Each of those two substances has a special function, that of the mucoprotein being the maintenance of transparency, and that of the residual protein the potentiality of gelability. The ultra-microscopic examination of the vitreous body[9] and a study of its physical properties demonstrate beyond doubt that it is, in a fresh and healthy state, a simple and homogeneous jelly or gel; that the fibrillar appearances seen histologically by the microscope are artifacts of coagulation, and the membranous appearances seen clinically by the slit-lamp are similarly optical artifacts. A study of its vapour pressure isotherm[10] shows that it is an elastic turgescible gel, capable of swelling and shrinking. Further, a study of its various reactions shows that, within the limits compatible with life, it tends to swell if the concentration of hydrogen ions is increased, and to shrink if this concentration becomes smaller; while, if its metabolism is upset, the whole gel structure tends to break down, the vitreous body turning fluid and the residual protein material becoming thrown out from its combined state into coagula forming fibres and strands and membranes such as are apparent in the clinical pictures of vitreous opacities with which we are all acquainted.

Here, then, is our second equilibrium. Two special colloid substances are secreted by the surrounding ectoderm, each having a special function of their own; these are percolated by the common intra-ocular fluid which enters into physicochemical combination with them, and the result is the formation of a gel. Always between the two, the intra-ocular fluid and the vitreous body, a continuous thermodynamical equilibrium exists, on the conditions of which depend events like the swelling of the vitreous body, or its shrinkage, or its breakdown into a fluid and the formation in it of opacities; while, superimposed upon this, and dependent to a large extent upon it, is the internal metabolic activity of the vitreous body on the efficiency of which depends its continuance as a homogeneous, solid, and transparent mass.

THE LENS.

The third equilibrium is that between the intra-ocular fluids and the lens. In this case we have some additional stresses in question. The lens to a certain extent forms a separate physicochemical mechanism semi-isolated from the remainder of the eye; its chemical composition is widely different from that of the intra-ocular fluids, to which, indeed, it may be said to bear a relationship showing some points of analogy with the relationship between the red blood corpuscles and the plasma. Corresponding to this, the osmotic pressure of the lens is considerably higher than that of the aqueous by which it is surrounded; it is, in fact, higher by an amount which is approximately equal to a 0·3 normal solution of sodium chloride. Owing to the tonic pull of the capsule through the zonule the internal tension of the lens is kept at a higher level than the remaining tissues of the eye; and therefore it follows that the osmotic tendency for fluid to enter the lens is counterbalanced by the opposing force exercised mechanically by the tension of the capsule favouring the hydrostatic diffusion of fluid out of the lens. Superimposed upon the normal thermodynamical equilibrium, there is therefore a constant expenditure of osmotic work acting against the filtration pressure generated by the ciliary muscle. The effects of the disruption of these forces are seen in their most dramatic form when the hydrostatic component is abolished by a rupture of the continuity of the capsule, and a traumatic cataract is formed. It is seen almost as dramatically when the osmotic balance is disorganised in diabetes when fluid tends to enter the lens.[11] If the process is a mild one the lens swells and is deformed, its curvature and refractive powers are increased, and the acute myopia of diabetes results [15]; if the process is more active, actual droplets of fluid are formed underneath the capsule, and eventually a typical diabetic cataract results. Again, if the efficiency of the membrane is impaired by radiant energy, the abnormal interchange which is thus allowed may, with a direct denaturation of the lens proteins, combine to bring about a radiational cataract.

We have thus a delicately balanced equilibrium between the intra-ocular fluids and the lens on either side of the membrane formed by the lens capsule. The story, however, does not end here. We have here again the same combination of two sets of circumstances as we have seen in the vitreous body. There is first the outer equilibrium, and here again it is to be noted that the two great factors in its derangement which are of greatest importance are an alteration in the concentration of the hydrogen ions and an alteration in the concentration of salts—both of these lead to swellings and shrinkages and disorganisation of the vitreous body, and both of them lead experimentally to the formation of opacities in the lens. The second set of circumstances is the internal metabolism. It has been shown that the metabolism of the lens is subserved by an internal autoxidation system, one of those very interesting and widely occurring mechanisms by which a chemical reaction is maintained in a state of constant and balanced activity, so that a continual reciprocal process of oxidation and reduction is maintained without any mediation of the gases of the blood stream. In this mechanism glutathione acts as a hydrogen donator and β-crystallin acts as a thermostable residue, and it has been shown that an upset of their reversible interaction is a constant accompaniment of the development of cataract. This again is essentially and primarily dependent on the state and the conditions of the outer equilibrium.

THE RETINA.

The fourth equilibrium we can deal with rapidly, not because of its less importance, but, unfortunately, because of our less knowledge of it. The inner cerebral layers of the retina are nourished by dialysation from the retinal vessels just as are the other ocular tissues, with the reservation that, provided as these vascular channels are with insulating perivascular glial sheaths, the cerebral type of circulation is maintained. But the sensory epithelium of the retina receives its nourishment by dialysation through the more distally placed vessels of the chorio-capillaris. Experimental evidence has been brought forward that a local upset of this process produces a derangement of the physico-chemical activity of the precipient elements of the retina such as is apparent clinically as a scotoma. I think it is probable that a disturbance of some such nature as this will eventually be found to account for some of the visual symptoms which may be present in disease. For example, in glaucoma, although the visual symptoms usually run parallel with the major symptom of tension, it cannot be claimed that the parallelism is invariably maintained, and it seems to me not unlikely that, if physico-chemical disturbances in the first two equilibria which we have discussed can give rise to a turgescence of the vitreous, which is evident clinically as a rise of tension, similar or related disturbances in this fourth equilibrium can as easily and as logically put out of gear the still more delicate physico-chemical mechanism which converts radiant energy into nerve impulses in the retina.[18]

CLINICAL APPLICATIONS: GLAUCOMA.

It will be realised that the clinical applications of these physiological considerations are far-reaching. Apart from inflammatory conditions, the pathology of which resembles that of similar conditions occurring in the other organs of the body, almost all of the major diseases of the eye, the treatment of which offers so many baffling problems, resolve themselves into exercises in physico-chemistry. Glaucoma, for example, is not, I think, a condition primarily of raised tension, but is an upset of the entire internal economy of the eye, most usually of a physico-chemical nature, the most frequent and clamantly obvious manifestation of which is an increase in the intra-ocular pressure. The facilities for drainage at the canal of Schlemm are not usually (although they certainly may be sometimes) the primary cause of the trouble; they frequently form the last link in a chain which determines mechanically the final crisis in the disease. There are probably two main factors in the ætiology of this disease, two factors which perhaps determine two types of the disease.[17] Pathologically these two types are evident; the one wherein the uveal vessels are dilated and are surrounded by an abundant exude of fibrinous coagulum; the other where the uveal tract and all the tissues of the eye are compressed and flattened by a swollen vitreous body. The first factor is a derangement of the capillaries, involving a dilatation, an increased permeability, and an upset of the first equilibrium between the intra-ocular fluids and the blood plasma. This may be dependent upon general causes—toxæmic, infective, dietetic, hormonal; it may be related to a derangement of the sympathetic nervous system; or, on the other hand, experimental evidence which we are at present accumulating suggests that it may be to some extent due to the local activity of specific substances in the eye such as choline. The second factor is an upset of the second equilibrium involving physico-chemical changes, such as swelling and turgescence, in the vitreous body. The occurrence of such an upset may depend upon considerations such as the concentration of hydrogen ions [13] or of salts [4] in association with the vitreous body, the inter-relation of its iso-electric points, its oxidative mechanism, or its internal metabolic activity. Certainly the clinical picture seen in many cases of acute glaucoma, and frequently of chronic glaucoma, strongly suggests that a swelling of the vitreous body is of primary importance. The shallow anterior chamber, the obvious pushing forward of the lens and iris, the thinning of the choroid and compression of the retina, combined with the fact that in quite a fair percentage of cases the angle of the iris seems pathologically to be free, points to this conclusion. If a damming back of fluid at the filtration channels were the primary cause, we would look for a deep anterior chamber owing to the retention of the aqueous humour. An obstruction of the filtration passages certainly abolishes the safety-valve mechanism which tends to prevent rises of pressure in the eye by allowing an escape of fluid; but it seems that, in many cases, its part in the ætiology of the disease is that of an adjuvant rather than of a primary factor. It may be that, in most cases, the changes in the vitreous depend primarily upon vascular changes and a derangement of the first equilibrium; while, on the contrary, it is possible that metabolic disturbances in the vitreous itself may secondarily promote the formation of choline-like bodies in the eye which may secondarily produce a vascular crisis in the capillary circulation. Or, even more probably still, the one may aid and abet the other, and a vicious circle may be inaugurated and maintained until the eye itself is strangulated.

Detachment of the Retina.

Again, idiopathic detachment of the retina very probably results directly from changes of the opposite kind, for I think that it is likely that it is preceded and accompanied in the great majority of cases by shrinkage and liquefaction of the vitreous gel. Such a liquefaction can be brought about in the laboratory by simple trauma or by an interference with its normal metabolism, in either of which case the gel breaks down and the residual protein separates out. When this occurs and when liquefaction or shrinkage of the gel takes place, the process is accompanied by a change in the physical state of the comparatively large quantities of water retained by absorption by the colloidal elements of the vitreous; this fluid, being released from its "bound" condition, will once more revert to its original state of "free" intra-ocular fluid. As such it can readily escape from the vitreous chamber, or even leave the eye through the filtration channels at the angle of the anterior chamber in the same way as the rest of the aqueous humour. Any small degree of increased tension in the eye from any cause whatever, no matter how incidental it may be, will involve a loss of some of the intra-ocular fluid through the filtration spaces at the angle of the iris. This is replaced by the exudation of a fluid rich in colloids during the phase of low tension which follows the phase of high tension; any increased capillary permeability arising, for example, from a local inflammatory lesion will lead to the same result, and the fluid thus exuding from the dilated choroidal capillaries will collect more easily underneath the ill-supported retina than any other place. With the retina unsupported by a solid mass, therefore, and deprived of a resilient and steady pressure from within-side, the stage is set and everything is ready for this tissue floating away from its surroundings on the slightest provocation. In this case the essential precursor and primary factor in the ætiology of a detachment of the retina of this nature is a biochemical change in the vitreous body involving a shrinkage of the gel mass and the replacement of part of its volume by free fluid; or, alternatively, a liquefaction of the whole or part of the gel with the formation of a sol containing opacities. It follows that the treatment is ideally by physico-chemical means, by bringing about a solidification and returgescence of the gel which will push the retina by pressure from behind back into place and retain it there.

Vitreous Opacities.

I have shown experimentally that the vitreous body in normal conditions is a gel in a high state of turgescence; as such it possesses an extreme degree of lability. So much is this the case that it can be transformed into a fluid solution by any slight interference with its normal condition. Now this gel-sol transformation is accompanied by the formation of a cloud of minute punctiform opacities and by the separation of the highly gelable residual protein into long films and strands. A similar transformation occurs under the influence of acid or alkaline solutions. In these circumstances the clear mass of gel shrinks up into a small fraction of its original volume; this, of course, is due to a loss of water on a large scale by the individual particles which become deturgesced and occupy a small fraction of their original volume. The fluid thus lost separates out as a clear solution leaving the shrunken gel mass behind. At the same time the gel becomes interspersed by an ever-thickening felt-work of white strands and fibres which alternate with gossamer-like membranes floating about in its interior, and the process goes on until the whole mass becomes turbid and opaque. This behaviour is exactly simulated by a gel of gelatin when it is saturated beyond its solubility limit at its iso-electric point, under which circumstances it turns into an opaque suspension.

We have thus arrived at an explanation, or at any rate at a tentative explanation, of the occurrence of one class of vitreous opacities. We may divide these into two kinds: first, exogenous materials, foreign inflammatory products which are derived from the ciliary body, the choroid, and the retina in cases of cyclitis, choroiditis, and retinitis. The pathology of these is already well understood; they are of the nature of exudates, leucocytes, and other inflammatory products, which may remain unchanged in nature for an indefinite time, or may undergo organisation, or even may assume frankly purulent characteristics. The second class of opacities is autogenous in nature, derived from the vitreous body itself by its partial or complete breakdown. Such a breakdown could readily be brought about clinically by a derangement of the metabolism of the vitreous such as would be caused by low-grade toxins, or by mild inflammatory processes. The strands and diaphanous sheets and membranes seen floating about in a fluid vitreous in a case of chronic cyclitis provide an appearance strikingly similar to that obtained experimentally in the test-tube when the proteins, especially the "residual protein," become coagulated out. Such is almost certainly the nature of the so-called "degeneration" of the vitreous in which the mass turns fluid and becomes filled with opacities which occurs in infective conditions, in senility, in advanced myopia, and which accompanies detachment of the retina.

Cataract.

Cataract, as we have seen, is another purely physico-chemical problem—the denaturation, hydrolysis, and coagulation of the proteins of the lens—and the essential opacities which occur in the cornea seem to be of the same nature. All of these conditions will before long be explicable, and all of them should eventually be curable or preventable by physico-chemical means.

Do not misinterpret me here. So far we can neither cure nor prevent a single one of them. With regard to some of them, it is true, we have got inklings of possible paths which may perchance lead us far along the road, and here and there one or two sign-posts have been erected leading no one knows whither. But on the whole we are merely at the stage of work, and work largely in the dark, relieved only by hopes and aspirations; and not within the lifetime of any of us will all of these hopes and aspirations be realised. I am merely trying to suggest a new point of view. In the past we have been looking at the diseases of the eye almost entirely from the viewpoint of anatomical pathology—a most useful and, indeed, a necessary stage in the evolution of knowledge. But hitherto we have tended to make too much, I think, of the structural ruins which disease has left behind it, and we have failed to see the deeper and more subtle nature of the initial defect.

Again, do not misinterpret me by crediting me with the suggestion that with the knowledge of physico-chemistry which we possess or which we can ever hope to possess, we will ever be able to penetrate fully into the processes of life and disease. It is true, I am convinced, that the body is a physico-chemical mechanism, and that consequently a physico-chemical method is the only one which can legitimately and rationally hope to elucidate its activities. But still more certainly we know that the chemistry or the physics at our command does no more than touch the fringe of the universe of natural phenomena. It would be dangerous to delude ourselves that there is any physiological process at all, with its multiplicity of parallel reactions, interdependent, inter-related, and interwoven, which is as yet so susceptible to simplification that it can be accounted for by a definitive explanation along these lines. At the same time I see no reason to despair that eventually the instability and plasticity of the physico-chemical structure of protoplasm may permit of an adequate and pragmatic explanation, and it seems reasonable to hope that in the future its ceaseless evolution, its histogenic powers, and its teleological attributes may to some extent, at any rate, be clarified. But even if it does finally become apparent that knowledge in its progress will never reach this goal, but, "like curves of the geometrician, will always approach but never attain its asymptote," we, in our own time, can share the spirit of adventure of the voyager who sails one stage further out upon the uncharted sea. And if we, as a generation witnessing these researches after truth, sharing in them, and doing our part to help them along, add even one small quota to the sum of experience and hand it on to our intellectual heirs, we, as a generation, may have it haply said about us that we picked up the mantle so grandly worn by McKenzie, and have done our best to carry it gallantly and well.

REFERENCES TO PAPERS BY W. S. DUKE-ELDER.

1. Biochem. Jour., 1927, xxi., 66. 2. Jour. Physiol., 1927, lxii., 315. 3. Brit. Jour. Ophthal., 1926, x., 513. 4. Jour. Physiol., 1926, lxii., 1. 5. Ibid., 1926, lxi., 409. 6. The Nature of the Intraocular Fluids, Brit. Jour. Ophthal., Monographs, 1927, iii. 7. Proc. Roy. Soc. Med., 1928, xxi., 817. 8. Brit. Jour. Ophthal., 1927, xi., 388. 9. Jour. Physiol, 1929, lxviii., 155. 10. Trans. Ophthal. Soc., U.K., 1929, xlix. 11. THE LANCET, 1926, i., 1188, 1250. 12. Report Internat. Cong. Ophthal., Amsterdam, 1929. 13. Brit. Jour. Ophthal., 1929, xiii., 385. 14. Ibid., 1926, x., 1, 30. 15. Ibid., 1925, ix., 167, 382. 16. Jour. Physiol., 1927, xliv., 78. 17. Brit. Med. Jour., 1928, ii., 236.

TREATMENT OF PERFORATED PEPTIC ULCER.

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MUCH has been written in recent years on the treatment of perforated peptic ulcers of the stomach and duodenum, and it is surprising how much opinion differs about the best surgical procedure. Some surgeons favour primary gastro-jejunostomy as a routine, whilst others never carry this out at the primary operation. Guthrie[1] sent a questionaire to 149 surgeons in America to ascertain their practice, and found that 22 performed primary gastro-jejunostomy as a routine, 64 never performed primary gastro-jejunostomy, and 63 performed primary gastro-jejunostomy in a shifting percentage depending on the condition of the patient. In view of these differences in practice it may be of interest to record the results of 158 cases of perforation of the stomach and duodenum operated upon in one hospital by several operators[*] in the last seven years, all using the same technique.

Briefly, our practice has been to operate upon all cases without selection—to close the perforation, to drain the peritoneal cavity, never to do primary gastro-jejunostomy, and to complete the operation with all speed.

Age Incidence.[†]—Perforation is uncommon in patients under 25 years and over 60 years of age. It occurs most frequently in the fourth and fifth decade but it is quite common in the sixth. Table I. shows the number of cases in each decade.

Sex Incidence.—In this series 152 were males and 6 were females, a proportion of 25 to 1. Two of the female cases were duodenal perforations and the remaining four were gastric.

Site of Perforation.—In our experience duodenal perforation is more frequent than gastric perforation. Of the 158 cases, 124 were duodenal and 34 gastric, giving a proportion of approximately four duodenal and one gastric. In no cases have we found more than one perforation at the time of operation. Recurrence of perforation at the same site has occurred in three cases: in one after an interval of 11 months, in another after four years, and in the remaining case after five years. In two of these cases no gastro-jejunostomy had been performed; in the third gastro-jejunostomy was performed but was undone at a later date for jejunal ulceration. Two years after the normal anatomy of the stomach had been restored perforation occurred again. Sometimes there is difficulty in deciding the exact site of the perforation in juxtapyloric cases, and our method of discrimination is to inspect and to palpate the pylorus carefully. The pyloric vein usually indicates the boundary-line between stomach and duodenum, but we place more reliance on the palpation of the pyloric sphincter by the finger and thumb of one hand to indicate the exact site of the lesion.

TABLE I.

Age in Q. G.	Total cases.	Duodenal.	Gastric.	Age in Q. G.	Total cases.	Duodenal.	Gastric.
Under 20	1	1	0	50–54	20	16	4
20–24	10	8	2	55–59	11	6	5
25–29	22	20	2	60–64	5	2	3
30–34	19	15	4	65–69	5	4	1
35–39	22	20	2				
40–44	20	15	5		158	124	34
45–49	23	17	6				

Q. G. = Quinquennial groups.

117
41
158

Treatment.

As soon as the diagnosis of perforation is made the patient is placed in the Fowler position and is prepared for operation. His transit from ward to theatre should be performed with the least possible disturbance of this position—that is to say, pillows are placed under the head and shoulders on the ambulance trolley and he is transferred to the operating table already fixed in an inclined position of 20 degrees from the horizontal. We believe that if this position is adopted from the beginning and maintained the bulk of the fluid gravitates to the pelvis by the time of operation, and less swabbing of the upper abdomen is required. Morphia gr. 1/6 and atropine gr. 1/100 are given as routine before operation. The anæsthetic employed in the majority of our cases has been open ether, but latterly we have used gas, oxygen, and ether.

Incision.—A median incision is used, extending from near the xiphoid sternum to the umbilicus. We have found this to give adequate exposure of the perforation in all our cases. The advantages over the paramedian incision are that this incision consumes less time, does not open the rectus sheath, and does not interfere with the use of the paramedian incision for any subsequent operation that may be required.

Closure of the Perforation.—The perforation is immediately sought and the fluid that usually obstructs the view is gently mopped up. The pyloric end of the stomach is held by the finger and thumb of the assistant in such a way as to bring the perforation towards the abdominal incision without exerting any undue traction. If the perforation is pyloric or duodenal, as it most frequently is, the right lip of the incision and the edge of the liver are protected by a swab and retracted. The perforation is closed with a single mattress stitch. Not infrequently, owing to surrounding inflammation, this is not possible, as the stitch cuts through the friable tissue; the surgeon therefore has to proceed to the next stage.

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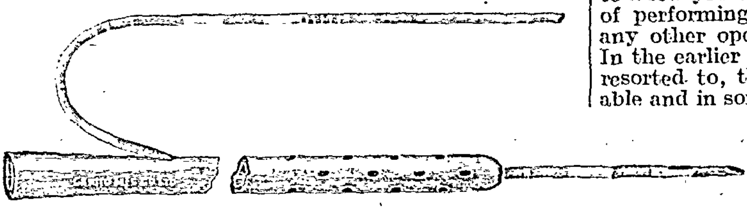
[*] In addition to the writers of this paper, Dr. G. S. Gawne, Dr. W. J. Birchall, Dr. T. R. Robertson, and Dr. S. C. Gawne.

[†] Since this paper has been written, a case of perforated gastric ulcer in a boy aged 16 years has been admitted to hospital. This case is being reported elsewhere by Dr. R. A. M. Pennington.

The ulcer is now infolded by a continuous catgut suture which, in the pyloro-duodenal area, should be transverse to the axis of the bowel and should begin well below and end well above the perforation. We use one seromuscular suture only, as the use of more causes too much invagination and consequent obstruction at the site of the ulcer. When there is much local induration and œdema it may be necessary to go some distance from the perforation to get tissue that will hold the suture. In cases of doubt the suture line is reinforced by stitching over it a piece of the right edge of the great omentum. Where the ulcer is a large one and the surrounding induration and inflammation is extensive the amount of infolding that is necessary to ensure closure of the perforation causes definite obstruction at the pylorus. This is overcome by a special procedure, the double tube technique, that will be described later.

FIG 1.



The double drainage-tube described in the text. (Made by the Genito-Urinary Manufacturing Co., Ltd., London.)

Excision of the Ulcer and Pyloroplasty.—We have done this in nine cases only. It takes extra time, but not so much as is required for a gastro-jejunostomy. It is not suitable for all cases, and can only be carried out with ease where the duodenum is movable. Of 55 consecutive cases in our series 26 have been suitable for excision and pyloroplasty as judged by the mobility of the duodenum and size of the ulcer perforation. When the duodenum is fixed to the posterior abdominal wall the operation is a difficult and dangerous one. Of our nine cases, three died; in one the result was unsatisfactory and in five satisfactory. Rowlands and Turner [2] quote twelve cases of primary pyloroplasty, of which five had recurrence of symptoms.

Cleansing the Peritoneal Sac.

Peritonitis is still the most frequent cause of death after operations for perforated peptic ulcer, and the prevention of this complication is of cardinal importance. While fully appreciating the natural power of the peritoneum to deal with noxious contents, it is easy to err on the side of expecting the peritoneum to do too much. It is argued that a large proportion of the fluid is protective peritoneal exudate. This is undoubtedly true, but at the same time analysis of the fluid shows that a very substantial portion of it is gastric contents, containing partially digested food, gastric secretion, mucus, and bile—all substances very noxious to the peritoneum. If such fluid can be removed by means other than peritoneal absorption it is clearly an advantage to the patient. Further, the infectivity of the fluid must be considered. In this connexion the observations of Bruett [3] in 112 cases are of importance. He reports that in the cases that were operated on from six to twelve hours after perforation the exudate was sterile in only 26 per cent. In cases more than twelve hours old only 7 per cent. had a sterile exudate. Among the bacteria found were staphylococci, *Streptococcus hæmolyticus*, *Streptococcus viridans*, and *Bacillus coli communis*. The type of infection and its virulence must always remain an unknown factor at the time of operation, and obviously the safest procedure is to remove as much as possible of this potential cause of peritonitis.

The ideal method of removing the fluid is one that does not entail manipulation and disturbance of the abdominal contents, and does not traumatise the endothelial covering of the peritoneum. Flushing, which at one time was the common practice, is now almost entirely abandoned. It was ineffective, spread contamination, lowered the blood pressure, and gave very unsatisfactory results. In our earlier cases we used swabbing extensively, but later experience has led us to use it less and less. In 62 of the cases we have at times, varying from a few months to a few years, reopened the abdomen for the purpose of performing a gastro-jejunostomy or carrying out any other operation that may have been indicated. In the earlier cases, where swabbing had been widely resorted to, the peritoneal adhesions were considerable and in some cases extensive. In the later cases, where swabbing has been reduced to a minimum and the chief reliance placed on drainage, the adhesions have been far fewer and in many cases practically absent. We have used suction in several cases but have been disappointed with it. It certainly removes a pelvic collection of fluid very effectively, but that is not all the fluid that is present. There is still a film left between the coils of intestine and mesenteric folds and, though the quantity in any one place is small, the amount in the whole contaminated area of peritoneum is considerable. For the removal of this disseminated contamination suction is ineffective. Moreover, the great omentum behaves almost like fluid and becomes entangled in the nozzle of the aspirator no matter what type of guard is used. Disengaging the omentum causes trauma and waste of time.

We now depend almost entirely on suprapubic drainage and, except in cases where the amount of intraperitoneal fluid is very small, we use drainage as a routine. In this series only three cases were closed without drainage. The insertion of a split tube through a suprapubic stab wound down to the floor of the pelvis and the rigid maintenance of the Fowler position we have found to be the most effective method of coping with peritoneal contamination. The tube is removed at the end of 36 hours. We do not concur with the view that a tube placed in the pelvis does not drain the peritoneal cavity. That such drainage is effective for a period of 24–36 hours is proved by the following observations.

FIG. 2.

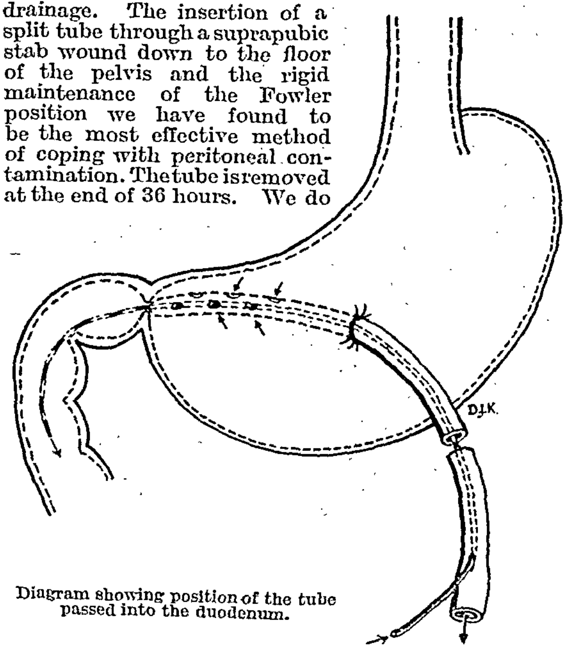


Diagram showing position of the tube passed into the duodenum.

In three successive cases of perforated peptic ulcer, after the tube had been inserted and just before stitching up the epigastric incision, 2 c.cm. of brilliant green was deposited in the peritoneal cavity at the side of the duodenum. The epigastric incision was closed in the usual way. Within a few minutes, and before the patient had left the operating table, the dye made its appearance through the suprapubic tube. The dressing was changed four-hourly, and the amount of staining of the gauze and wool noted. The staining was more intense in the first three dressings, and steadily diminished in intensity up to 24 hours. Between 24 and 30 hours the staining was only faint.

It is evident that, for 36 hours at any rate, the peritoneal fluid percolates into the pelvic cavity, and is forced through the tube by the positive intra-peritoneal pressure. The tube can be rapidly inserted in the following way. As soon as the perforation is closed, a large square swab is folded on itself four times; it is passed in the hollow of the left hand through the epigastric incision and applied to the peritoneum immediately above the symphysis pubis, taking care that there is no loop of intestine between the swab and the abdominal wall. A stab wound is made on to the swab. The hole in the peritoneum should be large enough to grip the tube firmly after it has been inserted. Instead of cutting down on to a swab one of us (C. H. W.) uses the head of a table-spoon on to the convex under surface of which two rings have been brazed to fit the index and middle fingers. The epigastric incision is closed without drainage.

The Double-tube Technique.

Where the ulcer is large and the surrounding induration extensive, the amount of infolding that is necessary to ensure closure of the perforation causes definite obstruction at the pylorus. This difficulty is overcome by means of a double tube (Fig. 1), which serves the dual purpose of draining the stomach promixal to the obstruction and introducing fluid into the duodenum beyond the obstruction. It is in effect a gastrostomy and an enterostomy. The outer tube is made of rubber similar to an ordinary catheter of about 22 Charrière. It is perforated with several holes for a distance of one and a half inches from the tip. There is a further oblique perforation at the side of the tube near the flange and a terminal one at the tip. This latter perforation is just large enough to admit a No. 8 ureteric catheter. The inner tube consists of a ureteric catheter, which is passed into the outer tube through the side hole near the flange and out through the terminal opening. The tip of the inner tube at the time of introduction should just present at the tip of the outer tube. The double tube is introduced through a small incision in the anterior wall of the stomach at a point about three inches from the pylorus. It is passed with the right hand and guided by palpation through the stomach wall with the left hand. When the outer tube abuts on the gastric side of the obstruction, the inner tube is pushed through the stenosis and guided on until its tip lies in the second part of the duodenum (Fig. 2). The perforated part of the outer tube thus lies in the pyloric part of the stomach and proximal to the obstruction. It is now fixed in the wall of the stomach after Stamm's method and brought out through the epigastric incision without kinking (Fig. 3).

The outer tube allows gas to escape, and any gastric contents that may come away are led into a bottle attached to the patient's dressing. The inner tube is used for introducing fluid into the duodenum by means of a record syringe, the needle of which is passed into the proximal end of this tube. Our practice is to give 40 c.cm. of glucose solution every half hour for the first twelve hours and then to diminish the quantity according to the needs of the patient. When not in use the tube is coiled up and fixed to the outside of the dressing with a safety-pin. The inner tube has usually served its purpose by the third day and can be removed, and the outer tube can be taken away any time after the sixth day.

The advantages of this procedure are obvious. 1. It provides a simple and effective way of administering much-needed fluid. 2. It drains the stomach and allows the escape of flatus, thus preventing the very distressing symptoms of gastric distension such as hiccough, nausea, and vomiting.

E. R. Schmidt[4] performs gastrostomy as a routine in all cases of perforation. We have not done this in any of our cases, but can testify to the amazingly smooth recovery of the cases in which we have employed gastric drainage as above described.

Gastro-jejunostomy at the Time of Suture.

On no aspect of the treatment of perforated peptic ulcer has there been more controversy than on the question of performing primary gastro-jejunostomy.

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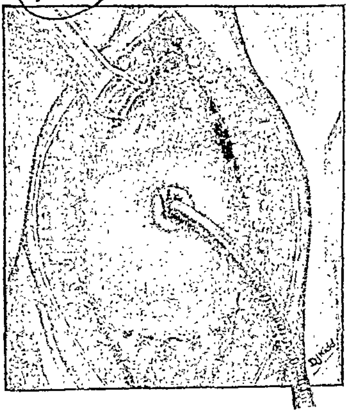
FIG. 3.



The tube emerging from the wall of the stomach.

Unfortunately, the statistics of the advocates of suture and gastro-jejunostomy are not comparable with those of surgeons who advise suture only. Gastro-jejunostomy is generally carried out in selected cases only, and the statistics of a series of such cases are therefore not comparable with a series when suture only has been done, for the latter would include the bad as well as the good operation risks. In many of our cases where, from the general condition of the patient and the duration and size of the perforation, the case would have been judged fit to withstand a gastro-jejunostomy, we have been impressed with the critical condition they have passed through (not accounted for by pyloric obstruction due to suture) before convalescence is established. We cannot but feel that in many of these cases the additional strain of a gastro-jejunostomy would have turned the scales against them.

More convincing than this clinical impression as to the inexpedience of primary gastro-jejunostomy is the evidence that it is not required in a large proportion of cases. C. E. Gibson[5] reports that only seven out of twenty-eight cases of perforated duodenal ulcer and one out of twenty-eight cases of perforated gastric ulcer required a second operation after suture alone had been carried out. E. H. Pool[6] writes that only one-third of the cases of simple suture develop later symptoms.

Mr. P. H. Mitchiner, of St. Thomas's Hospital, London, in a personal communication, gives figures of 69 cases operated on by him up to 1928. All of them were treated by simple suture without gastro-jejunostomy. In six only was there recurrence of symptoms requiring treatment by operation.

Our figures on this point are complicated by the fact that during the years 1923–26 we carried out delayed gastro-jejunostomy on all cases from six to eight weeks after simple suture. We felt then that an ulcer that was active enough to perforate was sufficient indication for a gastro-jejunostomy. After following this practice for four years we began to realise that in a considerable number of the cases the duodenum and pyloric canal had made such perfect recovery and showed so little deviation from the normal that gastro-jejunostomy seemed unwarranted. We therefore abandoned this practice and now perform secondary operation in those cases only where, after a period of observation, the indications are clear. Of 58 cases managed on these lines we have had to perform secondary operations in ten, but as these are our most recent cases it is probable that this figure will have to be increased. In the main, the cases that are deemed fit for primary gastro-jejunostomy are those with small perforations and slight pathological changes in the adjacent tissues; these are the very cases that will not require it. On the other hand, there is a fair proportion of cases in which the perforation in the neighbourhood of the pylorus is so large and the surrounding induration and fibrosis so extensive that the perforation can only be closed with deep infolding. Immediate or remote stenosis is almost inevitable; these are the cases in which primary gastro-jejunostomy is most strongly indicated, but unfortunately they are the more serious cases and the ones that are least able to withstand the additional strain. The immediate ill-effects of pyloric obstruction can be avoided by adopting the double-tube technique described above. At a later date—any time after six weeks—a gastro-jejunostomy can be performed without appreciably increasing the death-rate. We have carried out delayed gastro-jejunostomy in 56 cases with one death, which was due to broncho-pneumonia. In operating on a case of perforation one should have no thought for the remote result. The immediate object is to save life. These cases are always ones of grave emergency and ones in which the immediate prognosis must be guarded. The additional strain of a gastro-jejunostomy, however dexterously it may be performed, is not justified. The remote result can always be improved by a clearly indicated subsequent operation.

Results.

The more obvious factors concerned in the mortality are the duration, the site, and the size of the perforation. It is noteworthy that we could not trace any relationship between the age of the patient and the prognosis (Table II.). The older patients seem to do almost as well as the young. There are, however, other factors, the importance of which cannot be estimated at the time; the most important of these is the toxicity and type of infection of the intraperitoneal fluid. In our experience perforations of gastric ulcers are more fatal than duodenal perforations. This is due to the facts that gastric ulcer patients are in a lower state of health and the perforations are usually of larger size, with the result that there is more extensive flooding of the peritoneal cavity with toxic material. Furthermore, in five of the thirty-four gastric perforations the underlying condition was carcinoma. Table III. shows the immediate mortality in these cases of perforated gastric ulcer. It is arranged in groups of six-hourly periods, depending on the interval between perforation and operation.

TABLE II.

Age in Q. G.	Total cases.	Duodenal.	Deaths.	Gastric.	Deaths.	Age in Q. G.	Total cases.	Duodenal.	Deaths.	Gastric.	Deaths.
Under 20	1	1	0	0	0	50–54	20	16	5	4	2
20–24	10	8	2	2	1	55–59	11	6	1	5	3
25–29	22	20	5	2	1	60–64	5	2	1	3	2
30–34	19	15	3	4	2	65–69	5	4	3	1	1
35–39	22	20	2	2	2						
40–44	20	15	0	5	3	—	158	124	26	34	21
45–49	23	17	4	6	4						

The immediate cause of death in the twenty fatal cases was as follows:—

Shock of perforation and operation	7
General peritonitis and paralytic ileus	8
Broncho-pneumonia	1
Subphrenic abscess	1
Hæmorrhage	1
Empyema	1
Intestinal obstruction	1

The subsequent history of the 14 recoveries is as follows:—

3 have not required any further operative treatment.
3 have required posterior gastro-jejunostomy.
2 have required partial gastrectomy.

These eight cases have been examined recently and are completely satisfactory.

The remaining six cases have died from diseases as follows:—

2 from cancerous cachexia.
1 from myocardial degeneration.
1 from chronic interstitial nephritis.
1 from empyema following acute lobar pneumonia.
1 from broncho-pneumonia following operation for ventral hernia.

Table IV. shows the immediate mortality in 124 cases of perforated duodenal ulcer. It is arranged as in the gastric cases.

TABLE III.

Hours of perforation.	Total cases.	Recoveries.	Deaths.	Mortality per cent.
0– 6	12	8	4	33·3
6–12	12	6	6	50
12 +	10	—	10	100
—	34	14	20	59

TABLE IV.

Hours of perforation.	Total cases.	Recoveries.	Deaths.	Mortality per cent.
0– 6	67	60	7	10·4
6–12	39	30	9	23
12–18	8	4	4	50
18 +	10	4	6	60
—	124	98	26	20·96

The immediate cause of death in the 26 cases has been:—

General peritonitis and paralytic ileus	16
Shock of perforation and operation	3
Broncho-pneumonia	7

The subsequent history of the 98 cases has been as follows:—

41 have remained satisfactory without further operation.
53 have had posterior gastro-jejunostomy, of which 51 are satisfactory: the other two developed jejunal ulcers and required further surgical measures.

The above 94 cases have been examined recently and we have classified them as satisfactory on these grounds. The patient has a good appetite; has no pain and no vomiting; has little or no flatulence; his weight is stationary or has increased; bowels are regular; scars are healthy; general condition is good; and the patient is able to follow his usual occupation.

Four cases have died subsequently from diseases as follows:—

1 from an accident causing fractured base of the skull.
2 from pulmonary tuberculosis.
1 from broncho-pneumonia following posterior gastro-enterostomy.

Our thanks are due to Dr. R. T. Bailey, medical superintendent, Mill Road Infirmary, Liverpool, for the facilities he has afforded us in carrying out these investigations; also to Sisters L. Handley and E. Irving for the painstaking and efficient way in which they have helped us to follow up the cases.

References.

1. Guthrie, D.: New York State Jour. Med., xxiii., 66.
2. Rowlands, R. P., and Turner, P.: Operations of Surgery, London, 7th ed., vol. ii., p. 117.
3. Bruett, H.: Beitr. Z. klin. Chir., 1927, cxxxviii., 601.
4. Schmidt, E. R.: Acta Chirurg. Scand., 1922, lv., 314.
5. Gibson, C. E.: Jour. Med. Sci., 1923, clxv., 809.
6. Pool, E. H.: Ann. Surg., 1922, lxxvi., 475.

PARATHYROID TETANY AND CATARACT.

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THE association of cataract and muscular spasms has long been recognised, but only gradually have their connexion with an underlying parathyroid deficiency been shown. The results of extirpation of the parathyroids in animals and man have proved the constancy of this syndrome.

In 1906 Erdheim,[1] after removal of the parathyroid glands in rats, observed the onset of tetany, followed six months later by cataract. Hayano[2] also studied the eyes of young parathyroidectomised rats, and in almost all cases observed the appearance of lenticular opacities within a few days of operation. In 1915 Edmunds[3] described the development of cataracts in a parathyroidectomised dog. The animal had been kept alive for two years after operation, tetany being controlled by milk and intravenous calcium injections. The cataracts developed after 23 months. This was confirmed by Dragstedt, Sudan, and Phillips,[4] who discovered *cataracts in six parathyroidectomised* dogs in whom tetany was being controlled by doses of calcium lactate. These cataracts developed in from three to six *months after operation, and pro*gressed in some cases to complete opacity.

In human beings a number of cases of this combination following thyroidectomy have been described. In a review of the recorded cases in 1928, Jacques[5] has collected 31 cases from the German literature, one English case, and described two more. Others have been described by Sainton and Peron,[6] Aub,[7] and Hunter.[8] The following is an account of a further case.

History.

A married woman, aged 34, with three healthy children, first attended out-patients at Addenbrooke's Hospital on March 23rd, 1929. She complained of fits, tingling in the backs of the hands and in the feet, and attacks of dimness of vision.

One sister, aged 14, has a goitre, which was first noticed at the age of 12. One brother died of pulmonary tuberculosis.

History of Present Illness.—The patient was born in Norfolk, and lived there until she was 18. After this she spent periods in Buckinghamshire and Yorkshire, but for the last few years she had lived near Cambridge. At the age of 18 she first noticed a goitre. At 19 she had an operation for removal of glands from the side of her neck. The goitre gradually increased in size, and at the end of 1927 began to cause her great discomfort from pressure. This was especially marked when she lay down, and she then felt she was being choked.

In February, 1928, the pressure symptoms became so severe that partial thyroidectomy was performed. At the operation both lateral lobes of the thyroid gland appear to have been completely removed, while the middle lobe was left. Sections of the excised thyroid showed normal thyroid tissue. The vesicles were distended with colloid, but there was no evidence of hyperplasia.

Within a week of operation she found she could not use her hands properly on account of stiffness of the fingers. When she was drinking a cup of tea her hand would stop in the position in which the cup was held, and would sometimes remain fixed thus for ten minutes. The backs of the hands were intermittently tingling as if they were very cold; when, however, she put them into hot water this became worse. This sensation extended up as far as the middle of the forearm. The elbows were not affected. At the same time there was tingling of the same nature in the feet, but this was less marked, and *the feet did not at that time become fixed.* When the tingling sensation came on in the hands and feet and the hands became fixed the corners of the mouth seemed to be pulled sideways. The tongue "seemed to be cramped," so that she could only use it with difficulty to speak or eat, and swallowing was very difficult. The eyes or voice were not affected at that time.

These symptoms persisted with varying intensity until July, 1928. She was always unable to do any fine work such as knitting or writing, although she could do both these things well before operation. At times she had great difficulty in feeding herself because of the tendency of the hands to become fixed "because they used to go cramped the way I was holding anything." Within a few weeks of the operation cramp came on in the feet, and they used to become fixed in the position in which they were put for ten minutes. The toes were generally drawn downwards and plantar-flexed. This was never sufficiently severe to prevent her walking. At this time the eyesight was not affected, but on extreme deviation of the eyes to the right or left she sometimes had difficulty in bringing them back into the midline position.

In July, 1928, she had a fit. This came on suddenly, without any warning, in the shape of tingling or cramp in the hands or feet. She lost consciousness completely, and did not come round again for over an hour. Her husband described her as very blue during the early part of the fit, and foaming at the mouth. Spasms affected the hands and feet particularly. After this fit she could not see properly after she regained consciousness for almost an hour on account of a mist in front of her eyes. This dimness of vision then passed off completely. In July she had two other similar fits, in one of which she was unconscious for three hours. Each fit was followed by dimness of vision, which passed off after a few hours. She had no more fits after July until the following December. Then she began to have fits daily, at first in the morning when she woke up, but later she had two or three every day, and was liable to them at all times of the day. These continued until March 16th, 1929, and then stopped. In the intervals between the fits tingling of the backs of the hands, stiffness of the wrists and fingers, with complete inability to knit or sew or perform fine movements, *stiffness of the tongue,* and *tingling* and stiffness of the feet continued, sometimes worse, sometimes better. She could not associate the times of exacerbation and remission with any change in her diet or mode of life.

After the first few fits in December the mistiness of vision did not pass off so quickly, and gradually it became continuous, although worse after each fit. Between March 16th and 23rd she had no fits, but the other symptoms continued. Her eyesight did not improve.

Before her operation her periods had always been quite regular. Afterwards they were often irregular as regards time by a week, but were more scanty than before. In November, 1928, she had a miscarriage at two months. From November to March the periods became quite regular again.

On March 23rd she first attended out-patients at Addenbrooke's Hospital. Chvostek's sign was then very pronounced. Percussion over the various branches of the facial nerve at their outlet from the stylomastoid foramen caused twitching of the frontalis muscle as far as the middle of the forehead, of the muscles round the eye, the cheek, round the mouth, and between the corner of the mouth and the point of the chin. Trousseau's sign could not be obtained. She could see well enough to recognise people, and could read ¾ inch headlines with each eye from a distance of a few inches. The serum calcium was found to be 3·2 mm. per 100 c.cm. Accordingly she was ordered a pint and a half of milk and two eggs daily, and given calcium lactate 3 drachms daily.

On April 4th she was admitted as an in-patient. After three days on the above régime her tetanic symptoms became very slight, and she was left with only an occasional tingling feeling in the back of the hands. Her eyesight, however, grew rapidly worse, and on the day of admission she complained that she was almost completely blind.

Physical Signs.

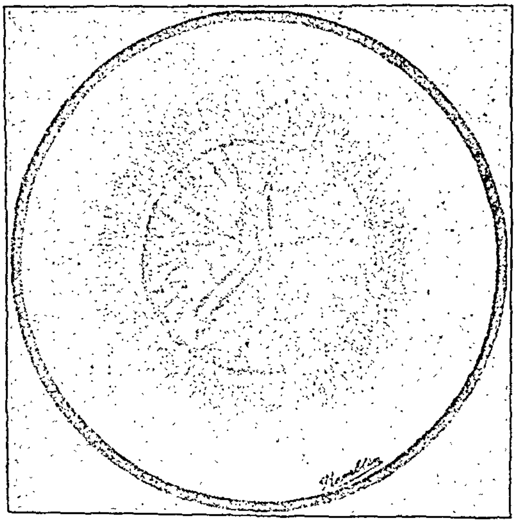
The patient was a robust, healthy-looking woman, with a slow placid manner. Height, 5 ft. 6 in.; weight, 9 st. 1 lb. Intelligence and memory good. Mucous membranes normal in appearance. Hair normal in all parts of the body. Skin normal. Finger- and toe-nails normal. Calcification of the teeth apparently rather above the average, and no caries present (Mr. H. Curtis). The larynx showed no abnormality. Voice and hearing normal. No abnormality found in the central nervous system.

Eyes.—Discs could not be seen on account of the cataract. The patient complained of a white mist in front of the eyes, and both right and left eye could detect movement of the hand at one foot. On examination with the slit-lamp Mr. Arthur Cooke reported: "Both lenses show fairly generalised *cataract*, both central and nuclear, laid down in large pyramidal masses, with bases towards the periphery. These are of no great density, but enough to obscure the red reflex without obliterating it entirely." (See Fig. 1.)

In the *neck* the incisions for thyroidectomy had left an extensive collar scar 6 in. long. A mass of thyroid tissue the size of a golf ball was palpable directly in front of the trachea. No remnants of the lateral lobes could be palpated.

Chvostek's sign was positive. Light percussion over the branches of the facial nerve below the ear caused twitching of the corners of the mouth. The twitching of other parts of the face observed in out-patients ten days before had disappeared. Trousseau's sign was completely negative. Inflation of a sphygmomanometer bag around the upper arm for a period of five minutes produced no abnormal sensations or spasm of hand.

FIG. 1.



Slit-lamp drawing of cataract in the left eye. The changes in the right eye were of equal intensity.

Examination of the heart, lungs, abdomen, and urine was negative. The blood pressure was 115/75, and there was no arterial thickenings or tortuosity.

Other examinations gave the following results:—

Galactose tolerance test: Within normal limits.
Renal efficiency tests: Kidneys efficient.
Wassermann reaction: Negative.
Basal metabolic rate: −2·5 per cent.
Carbon dioxide combining power of the blood: 62 c.cm. per 100 c.cm. serum.
Serum calcium*: 6·2 mg.
Inorganic phosphate in serum (April 9th), 6·9 mg.

Controlled X rays showed no evidence of abnormal calcification in the bones or teeth.

Progress of the Case.

The effects of treatment with parathyroid extract and calcium are shown diagrammatically in Fig. 2. When it was desired to give a calcium-rich diet two pints of milk and two eggs were given, with additional calcium lactate daily. When it was desired to give a calcium-low diet milk and eggs were withdrawn, and the calcium lactate stopped. Collip's[9] parathormone was given by intramuscular injection in doses of 10, 20, or 30 units twice a day, and for one period this was replaced by a well-known brand of dried parathyroid extract by the mouth in doses of gr. 1/5 t.d.s. (equivalent to grs. 6 of the fresh gland per day).

An attempt is also made in Fig. 2 to show the correlation between the intensity of Chvostek's sign with the changes in the blood and the parathyroid and calcium dosage. It was found to be easy to differentiate three definite degrees of intensity of twitch which are represented as follows:—

0. Base line: No twitch at all.
1. Twitching at the angle of the mouth only.
2. Twitching at the angle of the mouth and the outer canthus of the eye.
3. Twitching also of the muscles between the angle of the mouth and the point of the chin, of the muscles of the cheek between the mouth and the eye, of the muscles round the eye, and of the muscles above the eyebrow as far forward as the midline of the forehead.

In this case the relationship between the degree of twitch and the serum calcium seemed to be approximately as follows:—

Serum calcium below 5 mg. per 100 c.cm.: third degree of twitch.
Between 5 and 7 mg.: second degree.
Between 7 and 9 mg.: first degree.
Above 9 mg.: Chvostek's sign negative.
Trousseau's sign was always negative.

With one exception the only symptoms, apart from blindness complained of during treatment, were tingling of the backs of the hands, and, to a lesser extent, of the feet, and stiffness of the fingers. These symptoms only persisted for three days at the commencement of the high calcium diet from April 25th to 28th (the serum calcium on the 28th was 3·2 mg.), and did not return again until the serum calcium fell to below 5 mg., when they appeared for a few days intermittently. For the remainder of the time they were absent.

The one exception was on the day following the day on which the left cataract was needled. Following the operation the patient felt sick and was unable to take any food or calcium lactate. After 24 hours she developed a typical attack of tetany, with hands fixed in the accoucheur position. The feet also were affected to a slighter degree. Calcium lactate was then given by the mouth, and the spasm and tingling gradually passed off. This was the only occasion while she was under observation in hospital on which both parathyroid and calcium were omitted at the same time, and also the only occasion on which she developed true tetany.

After 13 weeks in hospital this patient returned home. She is at present taking 12 drachms of calcium lactate daily, with two pints of milk and two eggs and no parathormone. On this her serum calcium keeps between 5 and 8 mg., she gets occasional attacks of numbness in the hands and feet, but since discharge has had no actual attack of tetany. Chvostek's sign is positive to the first or second degree. The cataracts are being treated surgically by Mr. Arthur Cooke.

Discussion.

An analysis of the 38 recorded cases shows that the results of partial or complete removal of the parathyroid glands may for convenience be divided into two categories: (1) alterations in the calcium and phosphate content of the serum associated with signs and symptoms of tetany; (2) changes in the lenses, nails, teeth, and hair.

Tetany.—In the present case the correlation between the serum calcium and the various manifestations of tetany are again clearly shown. Bauer and Ropes[11] have emphasised the value of calcium lactate ingestion alone in raising the serum calcium in normal subjects. In this case a high calcium diet and calcium lactate, although they had a marked effect in raising the serum calcium and controlling tetany, would not bring it to its usual level unless combined with Collip's parathormone.

In view of the claims for dried parathyroid extract given by the mouth, the effects in this case are interesting:—

Parathormone and a high calcium diet raised the serum calcium from 6·2 to 9·2 mg. in five days, causing Chvostek's sign to disappear, and maintained the calcium at about that level for the next week (dose 20, rising to 40 units daily). The dried parathyroid extract (gr. 1/5 t.d.s.), given for ten days with the identical calcium diet, was associated with a fall in the serum calcium from 6 mg. to 4·6 mg., a return of Chvostek's sign to the third degree, and a return of slight symptoms of tetany.

The clinical manifestations of tetany in this case are typical, except in one particular. Trousseau's sign was always negative, however low the serum calcium and however marked the other symptoms and signs of tetany. Inflation of the sphygmomanometer bag around the upper arm for five minutes did not cause the slightest tendency to spasm in the fingers on any occasion.

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* All serum calcium and phosphate estimations were done twice and the technique was controlled by frequent estimations on normal serum.

A clinical feature of special interest in Aub's case was the association of asthma and tetany. This patient had had two operations for moderately severe exophthalmic goitre in 1917, and for several years after this had severe attacks of asthma and tetany. These continued until treatment with Collip's parathormone raised the serum calcium to 7 mg., when both asthma and tetany ceased.

The significance of changes in the serum phosphates in parathyroid tetany are not well understood. Gates and Grant,[12] working with parathyroidectomised rabbits, found that a rise in the inorganic phosphorus occurred in some rabbits which did not develop tetany but that it was never absent in those that did, and was apparently associated with the onset of an acute attack. The average Ca/P. (calcium to phosphorus) ratio in normal rabbits was 1·9. In those animals that developed acute tetany after parathyroidectomy this ratio was changed, not only by a fall in the serum calcium, but also by a rise in the phosphates, so that the ratio was then usually below unity. Greenwald[13] has stated that in over 50 parathyroidectomised dogs tetany never appeared without phosphorus retention, and conversely a drop in phosphorus excretion was only observed in one dog in ten that did not develop tetany. Salvesen[14] found that the inorganic phosphorus of the blood-serum of completely parathyroidectomised dogs was considerably increased and tended to remain above the normal value. Salvesen, Hastings, and McIntosh[15] conclude that a fall in blood calcium is the significant factor in the development of tetany. In human beings with parathyroid tetany most recorded readings of the blood phosphates are slightly above normal. This is so in the present case. Variations in the serum phosphates, however, do not appear in this case to have any very close relationship to the degree of excitability of the muscles, whereas the relationship between the serum calcium readings and the intensity of tetanic manifestations is very close indeed. Albright and Ellsworth[16] have lately published some investigations on a case of idiopathic hypoparathyroidism in a boy of 14. They base their diagnosis on the following criteria: low serum calcium, high serum phosphorus, cataract, normal density of the bones by X ray and tetany aggravated by exertion. In this case the injection of Collip's parathormone in a dose of 50 units daily for four days caused an immediate increase in phosphorus excretion, reaching its maximum within two hours, an increase in the serum calcium, an increase in calcium excretion, and a decrease in the serum phosphorus. They bring forward evidence to show that the three latter effects are sequelæ of the increased phosphorus excretion caused in some way by parathyroid hormone.

FIG. 2.

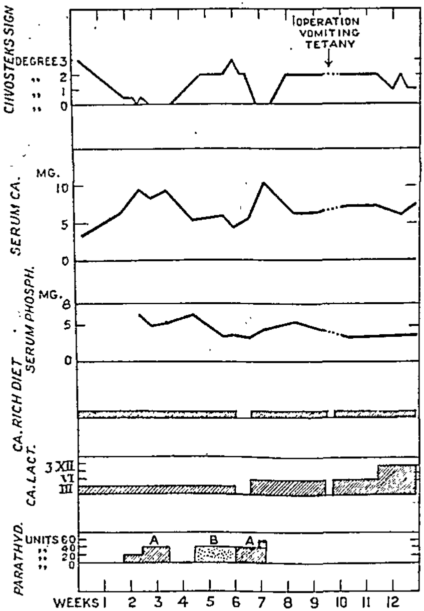

Chart showing variations in Chvostek's sign, serum calcium and serum phosphates during treatment with a calcium-rich diet, calcium lactate, and two kinds of parathyroid extract (A and B). A = Collip. B = Dried extract by mouth.

Changes in the lenses, nails, teeth, and hair.—In an analysis of the 34 cases of cataract after thyroidectomy quoted by Jacques and the four additional cases referred to here, changes of the hair and nails were present in eight and changes of the hair only in three more. In the case described by Sainton and Peron, during the two years following operation, the hair and nails fell out, and the teeth decayed rapidly.

> Two years after operation the patient was bald but for a few dozen dry brittle hairs, and was obliged to wear a wig. The nails were extremely brittle, the tint of old ivory in colour, and the normal striation was accentuated. These changes were accompanied by typical severe attacks of tetany and the development of bilateral cataracts. The authors comment on the fact that their patient showed no sign of myxœdema, although the greater part of the thyroid gland had been removed at operation. One year later the hair had grown again and the nails had become normal in appearance without any systematic treatment.

Jacques, in one of his cases, also describes a similar condition. About three months after operation a rapidly developing alopecia came on and the nails became friable. The teeth, however, showed no abnormality. On large doses of calcium lactate the hair grew again and the slight nail changes disappeared. This patient also showed no signs of myxœdema and the basal metabolic rate was + 3 per cent.

No satisfactory explanation has yet been put forward to account for these changes, and in the absence of more complete knowledge discussion is idle. One fact, however, is worth noticing in the present case, and that was the very rapid increase in the lens opacity which followed an increased calcium diet without parathormone. In two weeks vision practically disappeared in both eyes, while at the same time the tetanic symptoms disappeared. This observation would appear to support Greenwald's[17] evidence that in the absence of the parathyroid hormone there is an extensive deposit of calcium, probably in the form of calcium phosphate, in the tissues, and that the cataracts observed after parathyroidectomy may be due to a deposition of this salt in the lens. As a precautionary measure it seems to be unwise in severe parathyroid tetany, before cataracts have developed, to give an increased calcium diet without parathormone.

There appears to be no equality of effect in the structures affected. For example, in this case, although the serum calcium was extremely low and the tetany and cataracts very severe, the teeth were well calcified, and there were no changes whatever in the hair or nails.

Prevention.—If sufficient care is taken in operations on the thyroid gland extensive damage to the parathyroids should never occur. The rarity of such an event in England is probably due to the fact that thyroid operations are on the whole less extensive than they are abroad, and that most English surgeons make a point of leaving the upper posterior part of at least one lobe. In the case quoted here both lateral lobes seem to have been completely removed and only the middle lobe left behind. In America elaborate care is taken to prevent this accident occurring. In a review of 6700 goitre operations Lahey[18] mentions the fact that parathyroid tetany only occurred in three cases. This he attributes to the fact that at the time of removal all thyroid tissue was carefully examined for parathyroid bodies. If these were found and the findings confirmed microscopically they were at once grafted into the belly of the left sternomastoid muscle. That this technique produced a living graft was confirmed experimentally in dogs by R. B. Cattell and R. L. Mason.

Prognosis.—In this case treatment with parathormone appeared to have no effect on the cataract. This agrees with Jacques's observation on his second case, in which the cataracts continued to progress in spite of treatment with parathormone for eight weeks. Prognosis as regards sight apparently depends on successful surgical removal of the cataracts. There seems to be no reason why this should not be accomplished.

With regard to the tetany a high calcium diet and 12 drachms of calcium lactate daily keep the serum calcium between 5 and 8 mg., and the signs within the limits of a latent tetany. With parathormone as an additional weapon there seems to be no reason why the tetany should not remain completely controlled. At present, while the patient is blind, it is difficult to estimate her power of performing prolonged fine movements, such as knitting or writing. It may prove necessary to give parathormone regularly in the same way that insulin is given in diabetes.

In conclusion I should like to thank Dr. G. S. Haynes for permission to investigate and treat this case as an in-patient, Dr. C. E. G. Wolf and Dr. W. M. Wright for the laborious biochemical investigations they have carried out, Mr. Arthur Cooke for his examination of the eyes, Dr. Ffrangcon Roberts for the radiological examinations, and Dr. W. J. Young for the early history of the case.

References.

1. Erdheim, J.: Mitteil. a. d. Grenzgeb. de. Med. u. Chir., 1906, xvi., 632.
2. Hayano, R.: Quoted by Jacques.
3. Edmunds, W.: Proc. Roy. Soc. Med. (Ophthal. Sect.), 1915, ix., 53.
4. Dragstedt, L. R., Sudan, A. C., and Phillips, K.: Amer. Jour. Phys., 1924, lxix., 477.
5. Jacques, L.: Amer. Jour. Med. Sci., 1928, clxxv., 185.
6. Sainton, P. and Peron, N.: Rev. Neurol., 1922, xxix., 442.
7. Aub, J. C.: Boston Med. and Surg. Jour., 1926, cxciv., 844.
8. Hunter, D.: Proc. Roy. Soc. Med. (Clin. Sect.), 1928, xxi., 95.
9. Collip, J. B.: Jour. Biol. Chem., 1925, lxiii., 395.
10. ,, : Jour. Amer. Med. Assoc., 1927, lxxxviii., 565.
11. Bauer, W., and Ropes, M. W.: Ibid., 1926, lxxxvii., 1902.
12. Gates, F. L., and Grant, J. H. B.: Jour. Exp. Med., 1927, xlv., 121.
13. Greenwald, I.: Jour. Biol. Chem., 1924, lxi., 33.
14. Salvesen, H. A.: Ibid., 1923, lvi., 443.
15. Salvesen, H. A., Hastings, A. B., and McIntosh, J. F.: Ibid., 1924, lx., 311.
16. Albright, F., and Ellsworth, R.: Jour. Clin. Invest., 1929, vii., 183.
17. Greenwald, I.: Amer. Jour. Physiol, 1926, lxvii., 1.
18. Lahey, F. H: New Eng. Jour. Med., 1929, cc., 909.

A HOSPITAL FOR THE MIDDLE CLASSES.—The Merseyside Hospitals Council (Liverpool) is preparing a scheme for hospital and medical treatment of salaried workers and members of the middle-class generally.

THIRSK LAMBERT MEMORIAL HOSPITAL.—The annual report for the year ended Sept. 30th last shows that the daily cost per head of the 121 in-patients was 7s. 2d., as compared with 10s. 2d. in the preceding year.

TREATMENT OF PUERPERAL SEPTICÆMIA BY SERUM.

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THIS paper deals with the treatment of cases of puerperal septicæmia by concentrated scarlet fever antitoxic serum. Twenty-seven cases have been treated and eight of these have died—a mortality of 29·6 per cent.

Argument.

Theoretically, two conditions should be satisfied for the successful treatment of a given disease by a serum: the first is that the disease be in a strict sense due to a single infective agent, the second that the remedy contain the corresponding specific antibodies.

It has been confirmed by Armstrong and the author[1] that the great majority of cases of severe puerperal sepsis are due to the well-known hæmolytic organism *Streptococcus pyogenes*. We have suggested that the term "puerperal fever" be restricted to cases due to this streptococcus, for severe and fatal cases are caused almost exclusively by this organism. Further, we advocate that the diagnosis of puerperal fever should be based always on a bacteriological test and in consequence every case treated by serum in the series described in this paper has been proven due to *S. pyogenes* by cultures from the cervix uteri and the blood.

The term "serological identity," as applied to bacterial strains, entails specificity of a very high degree. The identity of all strains of *S. pyogenes* has not yet been determined, but it is certain that several serological groups of this organism occur and that, just as in the case of the pneumococcus, still other virulent strains, not included in these groups, sometimes cause serious illness. The first condition or postulate—namely, that the disease be due to a single cause—would remain unsatisfied, therefore, were it not for the fact that there is evidence that the exotoxins from all strains of *S. pyogenes*, including strains responsible for scarlet fever, erysipelas, surgical sepsis, puerperal sepsis, are very similar if not identical, the toxin from scarlatinal strains being considered the most poisonous and antigenically most efficient. The treatment of diseases due to *S. pyogenes* by scarlatinal antitoxic serum may perhaps be compared with the serum treatment of diphtheria, for there are several serological races of *B. diphtheriæ* but probably a common toxin.

Published Results of Treatment by Scarlatinal Antitoxin.

No published account has been found at the time of writing of treatment of puerperal fever by scarlatinal antitoxic serum although there are numerous references in the literature to the treatment, with varying success, of small groups of cases by other antistreptococcal sera. (Marmorek 1895,[2] Van der Velde 1904,[3] P. F. Williams 1921,[4] H. Bailey 1924,[5] &c.) Antiscarlatinal serum has been extensively used in the treatment and passive prophylaxis of scarlet fever and also in the treatment of erysipelas. It is not possible within the scope of this paper to do more than summarise these results.

O'Brien,[6] in 1927, thus summarised the action of the serum in scarlet fever. "Concentrated scarlet fever antitoxin is of use in the treatment of scarlet fever. No antitoxin or other serum at present available has any direct action on septic complications. The early use of serum probably reduces the length of stay in hospital, but many further observations are required."

Parish and Okell,[7] who are primarily responsible for the preparation of the serum used in the cases described below, found experimentally: (1) That acute and rapidly fatal septicæmia in rabbits due to hæmolytic streptococci obtained from cases of follicular tonsillitis, puerperal fever, cellulitis, &c., could be converted by administration of antitoxin into a subacute and relatively benign infection. (2) That the late complication of arthritis in rabbits was uninfluenced by the injection of serum, even in large doses.

It seems that there is a general impression in favour of the use of antitoxic serum in the treatment of scarlet fever, but both experimental and clinical evidence appear to lead to the conclusion that the later "septic" manifestations are uninfluenced. A similar criticism applies to erysipelas.

Apart from the cases to be described, I consider that the most suggestive and reassuring results have followed the use of the serum by my colleagues in severe surgical sepsis, including acute mastoid disease. It is evidence from these cases, rather than from the treatment of diseases predominantly due to streptococcal exotoxin, which has most encouraged me to persevere, for the clinical aspect of puerperal fever is essentially that of a bacterial invasion rather than a toxæmia.

Emphasis is laid on the fact that the serum used in the cases described here is antitoxic. If the results appear less satisfactory than in the corresponding treatment of diphtheria, it is suggested that the possibilities for serum treatment in severe puerperal sepsis are by no means exhausted. Better success may yet be obtained by using a serum rich in antibacterial, as contrasted with antitoxic, antibodies or a combination of both elements, although attempts so far to prepare such a serum have proved unsuccessful. In any event, it will be shown that large doses of serum may be given safely even in the severest cases of puerperal fever, and often with very striking results.

Method.

In order to test for serum-sensitiveness, 0·1 c.cm. of the serum was administered intradermally half an hour before the main dose. In no case did any reaction occur. This procedure was therefore discontinued after the first 13 cases. Serum in bulk was administered to the first 13 cases intramuscularly, in every subsequent case intravenous injection was exclusively performed. The maximum quantity administered by the intramuscular route on any one occasion did not exceed 30 c.cm. The maximum intravenous dose was 100 c.cm. and never less than 20 c.cm. Injections of serum were repeated as seemed desirable; there did not appear any limit to the number of doses which could be administered to the patient, but the greatest number given was four injections. Serum was given at intervals of not less than 24 hours. Treatment was determined by the patient's needs; a rigor in particular served as an indication for treatment or prolonged high fever with a rapid pulse.

Technique of Administration.

It is unnecessary to give details of the intramuscular method of administration for this has been discarded. Intravenous injection is performed with the customary aseptic precautions.

The apparatus consists of a conical funnel to which is attached a rubber tube two feet long carrying a short needle of wide bore. The patient's arm is exposed; an attendant clasps the upper arm or a bandage may be applied to congest the median basilic vein. The serum is diluted with an equal volume of physiologically normal salt solution and the container immersed in warm water to raise the temperature of the diluted serum to body temperature. The diluted serum is run in slowly; 20 minutes should be allowed for giving 200 c.cm. The puncture may be sealed conveniently by a collodion gauze. The vein should be practically undamaged and is used for future injections.

Reaction of the Patient.

The patient visibly reacts within half an hour to intravenous inoculation; the absence of some reaction is exceptional. In severe cases she shivers violently, her temperature rapidly rises, and may reach 105° F. or even 107° in 15 minutes with great acceleration of the pulse. The women complain of feeling very ill and of faintness. They sweat profusely but, notwithstanding, they are palpably hot to the touch. In two cases there was marked dyspnœa resembling asthma and in one hyperpyrexia was accompanied by a transitory delirium. These symptoms are to be attributed to the immediate effects of the administration of foreign protein and are proportional to the dose. The severe reaction lasts about half an hour and in favourable cases the temperature then falls, often becoming subnormal, with corresponding improvement in the general state.

It is of the most urgent importance that a hypodermic syringe charged with liquor adrenalin hydrochlor. B.P. strength 1 : 1000 be prepared before the serum is given, ready for immediate use if dyspnœa should develop. In such circumstances a dose of 10—15 minims is given subcutaneously without loss of time. Two only of the 14 cases treated by intravenous injection became dyspnœic and were given adrenalin, as a result of which the attack passed off.

The reaction following intravenous administration of serum may be very severe, therefore, but in no case has a fatal result been attributed to it. In any event it will be understood that the women were already seriously ill when treated. Serum rashes of urticarial type developed between the eighth and tenth day after treatment in two cases but without joint involvement.

Response to Treatment.

In favourable cases there are signs of improvement within 6 to 12 hours of treatment, judged by fall of temperature and diminished pulse-rate. The patient often declares herself better for the serum and clinically her aspect improves. This improvement may persist and lead on to recovery and the illness, in cases treated early, appeared actually to be cut short by the serum. Alternatively, improvement may be temporary only and in severe cases the temperature rapidly rises again.

Further administration of serum is usually followed by a favourable response, but the cases which proved fatal were but slightly influenced or not at all, and in one the severity of the rigors which marked the illness appeared to be exaggerated. The character of the response in each type of case is illustrated in representative charts.

Details of Treatment of Puerperal Septicæmia by Intravenous Inoculation of Scarlatinal Antitoxic Serum.

No.	Day of puerperium. Treatment— Begun.	Day of puerperium. Treatment— Ended.	Injections.	Vol. of serum.	Day of R. or D.	Result.
				c.cm.		
1	4	8	3	250	8	R.
2	2	16	3	90	17	R.
3	5	15	4	80	16	R.
4	7	20	3	150	18	R.
5	6	8	2	40	9	R.
6	7	7	1	50	8	R.
7	6	7	2	150	8	R.
8	5	7	2	100	8	R.
9	5	16	4	100	17	R.
10	12	15	3	170	22	R.
11	19	19	1	100	20	D.
12	4	6	2	150	7	D.
	Day after abortion.					
13	6	9	2	130	22	D.
14	6	9	4	210	15	D.

R. = recovery; D. = death.

Details of Cases.

Twenty-seven cases have been treated with eight deaths, a mortality of 29·6 per cent. The details and results of the 14 cases treated by intravenous inoculation are here tabulated.

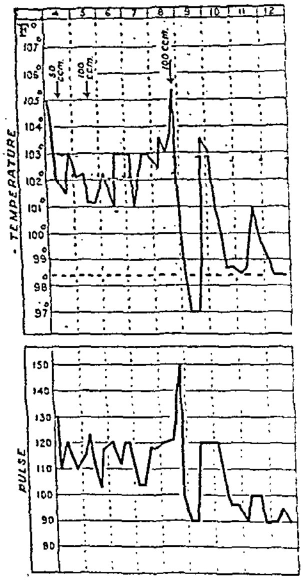
The following three cases, one of them fatal, have been selected to illustrate the effect of serum on the temperature and pulse-rate.

CASE 1 (Fig. 1).—Primigravida, aged 24, delivered at home. Labour normal, two vaginal examinations made. Rigor two days after delivery, temperature rose to 102° F. Admitted to hospital on fourth day of puerperium. Delirious on admission, temperature 105° F., pulse 130. Uterus involuting normally, lochia scanty. *Streptococcus pyogenes* grown in pure culture from the cervix uteri and the blood. 50 c.cm. of serum given intravenously on the fourth day without effect; 100 c.cm. on fifth day without effect; 100 c.cm. on eighth day followed within two hours by a fall of temperature and pulse-rate, the patient becoming rational for the first time since admission. Recovery rapid and uninterrupted, except for a rise in temperature on the following day.

CASE 2 (Fig. 2).—Primigravida, aged 19, delivered in hospital, vertex presentation, labour lasted nine hours. A sore on the patient's hand, from which *S. pyogenes* was recovered, was believed to be the source of infection. Temperature rose to 104° F. the day after delivery. Blood culture on the third day of the puerperium showed pure growth of *S. pyogenes*. 30 c.cm. of serum given on fourth day followed by a gradual fall of temperature and pulse-rate and improved general condition. Temperature 104° F. on ninth day, 30 c.cm. of serum given, and the temperature fell. Temperature again rose sixteenth day but blood culture negative, 30 c.cm. of serum given on this day; the puerperium subsequently normal.

CASE 3 (Fig. 3).—Multipara 3, aged 27. Threatened abortion at third month with hæmorrhage uncontrolled by drugs: admitted to hospital, uterus evacuated. Four days later temperature rose to 104° F. 30 c.cm. serum given on third day of fever, followed by a temporary fall in temperature and pulse frequency. 100 c.cm. serum given on sixth day of fever, again a temporary fall in temperature and pulse. No further serum given; death on twentieth day of disease. A metastatic broncho-pneumonia developed. *S. pyogenes* isolated from blood and uterus on third, sixth, and eleventh days of the disease. Serum treatment was perhaps insufficiently pressed in this case.

FIG. 1.



CASE 1.—Temperature chart from the fourth to the twelfth days of the puerperium, showing response to an injection of 50 c.cm. serum and two injections of 100 c.cm.

Bacteriology.

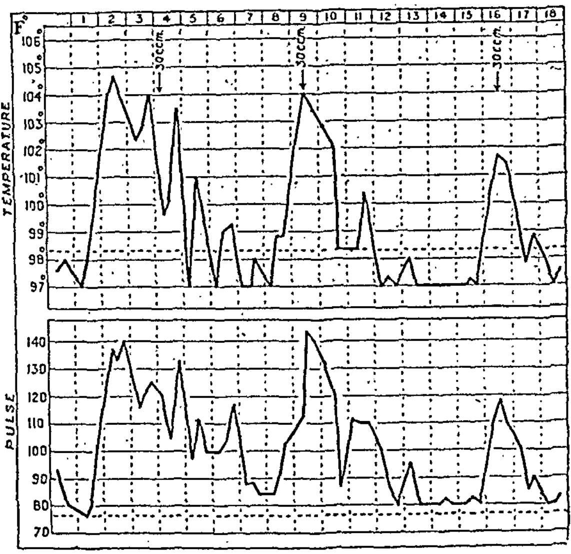
A blood culture and cultivations from swabs from the uterus were made in every case so soon as observation began, usually just prior to administration of serum. In every case typical *S. pyogenes hæmolyticus* was recovered from both sources. In six cases an attempt was made to estimate the number of streptococci present in the patient's blood. Half a cubic centimetre of the freshly drawn blood was spread over the surface of a blood-agar plate kept in readiness by the bedside. Quantitative blood cultures were made day by day in three cases which recovered and the number of organisms per c.cm. of blood was found to diminish as the patient's condition improved. One fatal case showed 75 colonies per c.cm. on the third day of the disease and on the seventh day 150 colonies per c.cm. In a second fatal case 100 colonies per c.cm. were grown on the fourth day. With increasing experience it may be possible in future to base a prognosis on the severity of the blood infection and so establish a standard by which the results of special treatment may be estimated.

The number of observations made was small, and it has not been possible as yet to compare the bacteriological technique used with other recognised quantitative methods of blood culture.

Discussion.

The importance of advancing the treatment of puerperal *septicæmia* is great and justifies publication of a relatively small number of cases at this early stage. I believe that the patients are definitely the better for scarlatinal antitoxic serum, but recognise that other methods of treatment have raised similar hopes in the minds of those who have used them. It seems that, to be successful, treatment should be begun at the earliest possible moment, and furthermore that persistence in the treatment is essential. It is perhaps permissible to state that courage is required in the application of the remedy for the patients are often desperately ill, and the immediate result of intravenous injection of the concentrated serum is at times very severe.

FIG. 2.



CASE 2.—Temperature chart from the day of delivery to the eighteenth day of the puerperium, showing response to three injections of 30 c.cm. of serum.

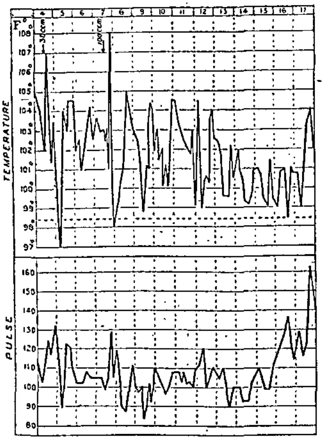
Results claimed for any specific serum are always open to the criticism that "protein-shock" is responsible for the effects produced rather than the neutralising action of specific protective substances. In this connexion it would have been instructive to have treated similar cases by concentrated horse serum—that is to say, by administration of the "vehicle" without the "remedy"; this procedure is contemplated.

Not the least of the difficulties in estimating the value of the special treatment of sporadic diseases such as puerperal fever is the small number of cases available at any one time and in any one place. Statistics of the mortality from puerperal septicæmia are to be found in two reports,[8] presented to the British Congress of Obstetrics and Gynæcology in 1925, respectively by a London Committee on the prognosis and treatment of puerperal sepsis and a committee of the North of England Society for Obstetrics and Gynæcology on puerperal blood infections. Rules were made and observed by both committees by which cases should be judged suitable to be recorded as blood infections.

The London committee studied 247 cases, amongst which the *mortality* was 36 per cent. Of these, 53 cases were definitely proven to have streptococci in the blood; the exact variety of streptococcus was not stated. The *mortality* in this group was 66 per cent. The Northern committee studied 154 cases; the *mortality-rate* was 76 per cent. The blood was examined during *life* in 75 of these cases and streptococci grown in over 65 per cent.; the mortality in this group was not stated. In 22 cases of which full particulars were available and were tabulated, 19 died, all with positive blood cultures; the three survivors showed negative blood cultures.

With regard to special treatment, the London committee report 33 cases conforming to the rules, treated by antistreptococcal serum and injections of quinine and a mortality of 18 per cent. Eleven patients were treated by intramuscular injections of quinine alone and all recovered; 14 patients were treated with antidiphtheritic serum and only one died; three patients treated by neosalvarsan and collosal iodine all died. The Northern committee report 101 cases treated by antistreptococcal serum and give an analysis of the quantities and details of administration of the serum. One hundred and four cases treated by antistreptococcal and other sera, on which operations were also performed, showed a mortality of 72 per cent., and 47 cases treated by serum, on which no operation was performed, a mortality of 76·5 per cent. In view of these widely varying results, no safe conclusions can be drawn from the results recorded in this paper—namely, 27 cases treated and a mortality of 29·6 per cent. Bright hopes may have been founded on the total recovery of the 11 cases mentioned above, treated by intramuscular injection of quinine, or on the 14 cases with only one death treated by antidiphtheritic serum, yet neither method has become generally established. Far-reaching experience coupled with the most rigid impartiality must indeed be exercised in assessing the value of special treatment. The conclusion seems forced that in the absence of a method of accurate estimation of the severity of a given case of puerperal septicæmia the existing statistics are of doubtful significance.

FIG. 3.



CASE 3.—Temperature chart from a fatal case of septicæmia following abortion. Two injections of serum, of 30 c.cm. and 100 c.cm., were given.

My thanks are due to the Wellcome Physiological Research Laboratory for the generous gift of serum and for cordial interest. I am indebted to the Staff of the Obstetrical Department of St. Bartholomew's Hospital and to my colleagues at the City of London Maternity Hospital for cases, and to Dr. R. R. Armstrong for help in drafting this paper.

Since completing this paper I have treated three cases, in all, of puerperal septicæmia with the same serum and all proved fatal. I also have had four cases of severe infections with organisms other than *S. pyogenes*, all of which responded to treatment with this serum. Doubt therefore exists whether the serum acts specifically or not.

References.

1. Armstrong, R. R., and Burt-White, H.: Brit. Med. Jour., 1929, i., 592.
2. Marmorek: Ann. de l'Inst. Pasteur, 1895, ix., 593.
3. Velde, van der, and Peham: Arch. f. Gynäk., 1904.
4. Williams, P. F.: Amer. Inst. Obst. and Gyn., 1922, iv., 636.
5. Bailey, H.: Amer. Inst. Obst. and Gyn., 1924, vii., 658, and 1924, viii., 7.
6. O'Brien, R. A.: Proc. Roy. Soc. Med., 1927, xx., 163.
7. Parish, H. J., and Okell, C. C.: THE LANCET, 1927, i., 71.
8. Report on Fifth British Congress of Obst. and Gyn., Brit. Med. Jour., 1925, i., 779.

NOTES ON THE TREATMENT OF
GONORRHŒA IN THE MALE.

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GONORRHŒA restricted to the anterior urethra is a trivial complaint. Its importance rapidly increases as infection spreads and the posterior urethra and contiguous parts are successively involved.

Our first care is to support the patient's immunological defences by regulating personal habits and activities, and by rendering the urine at once less irritating and less favourable to the multiplication of gonococci by dilution and alkalisation. Local measures will aim at destroying germs and controlling inflammation without injury to the urethral lining.

It is questionable if the dietary restrictions commonly imposed are of much practical value. The withdrawal of meat, tea, coffee, ordinary condiments —and tobacco—is sufficiently a deprivation to cancel any theoretical gain, and excellent advice about rest and the speculative advantages of a milk diet chiefly adds to the characteristic mental depression of the patient. Competitive games, dancing, and equitation should be given up, sexual excitement is to be avoided, and alcoholic beverages, ginger ale, ginger beer, and cider are definitely harmful.

The ideal antiseptic for use in the inflamed urethra would be clean, non-irritating, penetrative, stable in aqueous solution, and effective alike against the gonococcus and any secondary organisms without being toxic to the host. At present no single preparation fulfils these requirements. Potassium permanganate is a feeble germicide, colours the skin and clothing, and seems to encourage intraurethral and paraurethral complications, its principal effect being to provoke a rapid and intense œdema undesirable in the early inflammatory stage. Mercurochrome is an exceedingly interesting experiment, mercury being linked to a dye in an effort to produce a deeply penetrating antiseptic. It penetrates well but stains everything it meets an almost indelible red, is distinctly irritating, and, as a urethral antiseptic, disappointing. Acriflavine also stains, and is subtly irritating, but is otherwise a quite useful all-round germicide, penetrative to a degree, unaffected by urine, and to be recommended for occasional rather than routine use. In a mixed infection it is my practice to employ separate agents for the gonococcus and saprophytes, *used together if chemically compatible*, seriatim if otherwise, the gonocide being frequently changed to avoid "fastness." Mercury oxycyanide, for example, is quite good against the staphylococcus and other followers, but an indifferent gonocide, while the innumerable silver colloids provide many reasonably effective gonocides, often not too clean, but bland and non-irritant when freshly prepared, and eminently suitable for use in the inflamed urethra. Among the milder silver preparations, indicated in the early stage as gonocides, the writer favours argyrol, neoreargon, neoprotosil, cargentos, and collosol argentum, to be succeeded by albargin, hegonon, novargon, protargol, acriflavine hydrochloride, thallin sulphate, or silver nitrate later on as symptoms decline, and a little stimulation seems desirable.

Use and Abuse of Irrigation.

When anterior gonococcal urethritis terminates favourably damaged epithelium is shed, tension in the tissues diminishes, gonococci vanish, the meatal discharge lessens and stops, pus cells are no longer recoverable from the urine, and the urethral mucous membrane resumes its normal appearance. This is clinical cure and in established infections should be complete in three or four weeks. The failure of symptoms entirely to disappear may be due to over-treatment, the first urine containing light tissue detritus and perhaps just sufficient muco-purulence to render it slightly hazy. The presence of heavier flakes and many pus cells, and, particularly, the discovery of gonococci, indicate the persistence of infection deep in the tissues, in Littré's glands, the lacunæ of Morgagni or adventitious passages, or that infection has reached the posterior urethra. The latter development may be heralded by terminal hæmaturia, signifying an acute onset, and since much more serious events are now in prospect, correct management at this point is of obvious importance. The worst thing one can do is to attempt to irrigate the bladder from the meatus, infection of the seminal vesicles and prostate being in such case almost inevitable and extension to the epididymes likely. A better plan is to insert per rectum a suppository containing morphine sulphate (gr. ¼) and atropine sulphate (gr. 1/75), to be repeated in four hours, add tincture of hyoscyamus to the alkaline mixture, and omit all local treatment for 48 hours. At the end of this period the anterior urethra should be washed first with half-saturated acid boric solution and then with collosol argentum, after which a sterile No. 8-E. soft rubber catheter is introduced beyond the cut-off muscle and an ounce or more of collosol argentum allowed to trickle slowly into the posterior urethra and bladder, to be retained. This procedure is repeated in 24 hours, and thereafter 1 per cent. protargol may be substituted for a day or two, or retrograde lavage at once commenced with silver nitrate, 1–5000, containing 1 per cent. acid boric. More often posterior urethritis begins insidiously and pursues from the first an essentially chronic course.

While infection is restricted to the anterior urethra, local treatment is performed using a small all-glass acorn-tipped bulb or piston syringe. With the extension of inflammation beyond the bulbous portion to the membranous and prostatic urethra antiseptics must be carried past the cut-off muscle, and the method of their introduction is of some importance. With the Janet method of irrigation from the meatus there is the danger of injuring the inflamed mucous membrane through over-distension, and Kohnstam and Cave[1] have shown how easily fluid is driven into the seminal vesicles during forced irrigation of the bladder. For these and other reasons the retrograde method of lavage is preferable, the fluid being introduced into the bladder through a catheter or tunnelled sound and then voided naturally, when the tendency, if any, is to remove material by aspiration and contractile pressure from soiled glandular ducts.

The secretions of the seminal vesicles and (usually) the prostate are alkaline in reaction, a circumstance which might be expected to confer a certain protection against gonococcal penetration; but unfortunately does not do so. Inflammation may remain confined to the prostatic and ejaculatory ducts and, being catarrhal only, give little evidence of its existence. Where it is progressive the ducts become more or less occluded, drainage is impeded, the glands enlarge and become diseased. Owing to their vascularity, implication of the seminal vesicles is a threatening development, as toxic absorption is increased, and gonococci may eventually reach the general circulation; more commonly, however, there is extension along the ductus deferens to the epididymus. The advance of infection along the prostatic ducts leads to parenchymatous or interstitial prostatitis, the latter form proceeding to abscess formation.

Complications like epididymitis and hyperacute febrile inflammation of the prostate gland or seminal vesicles require the temporary cessation of treatment per urethram in favour of chemotherapy or vaccinotherapy, either of which is superior both in immediate and ultimate effects to operative or other methods in the writer's experience. The use of metals in this connexion is admittedly empiric, although there is an experimental basis for the belief that certain inorganic substances upon reaching the blood stream act like living or dead bacteria in inducing the leucocytes to liberate a non-specific bactericidal or bacteriostatic element. In practice it is often surprising how rapidly and completely acute epididymitis subsides after two or three intravenous injections of sulfarsenobenzene, and hyperacute inflammation of the other glands accompanied by temperature is almost equally well controlled by chemotherapy without, however, any marked effect being produced upon the general course of the disease.

Massage and the Passage of Sounds.

In health the seminal vesicles are difficult to distinguish per rectum, but they are readily palpated in disease, and there is a variable amount of conservative inflammation in the periglandular tissues. Depending upon the period and character of the infection, one or both lobes of the prostate may be enlarged, smooth and tense or, instead, feel nodular, suggesting a collection of lobulated masses. From the standpoint of remedial treatment, however, it is expedient to regard the inflammation of both prostate and vesicles as secondary, the primary lesions being in their ducts and the restoration of their calibre a necessary prelude to cure.

One or two quite light strokes are sufficient to empty a seminal vesicle whose duct is patent, and massage of the prostate gland should be of the gentlest description, a series of joined copy-book O's centripetally stressed from above downwards, and never the "firm downward pressure" of the older text-books. Massage at all violent readily injures these friable glandular tissues, and is more likely to retard than assist recovery. Nor is it necessary or desirable to attempt mechanically to empty either prostate or vesicles at each session if the trouble is, for practical purposes, obstructive.

There are experienced specialists who seem to counsel the abandonment of massage altogether, but it is a little difficult to accept this view. Light rectal massage seems needed to maintain tone and contractile power, combat stasis, and assist in the removal of cellular deposit, but the first consideration is to secure resolution of the inflammatory exudation in the urethral region so that adequate drainage may be re-established.

The passage of cold steel sounds, if properly timed, is a valuable aid in accelerating resolution and more effective than the use of dilators. It is often thought that the benefit accruing from instrumentation is wholly to be attributed to the mechanical stretching of the urethral canal, hidden foci being uncovered, crypts and folds ironed out, the lacunæ and Littré's glands pressed free of their contents. This explanation, however, is incomplete, for these are only incidental and relatively superficial effects of the passage of steels, more important being the influence upon plastic exudation, the resorption of which is actively promoted. In chronic anterior urethritis the parts become semi-indurated, and if inflammation persists connective tissue cells will gradually replace small cells in the subepithelial area, converting "soft" into "hard infiltration," found in organic stricture. The last, however, is a terminal condition and comparatively remote, and at an earlier stage infection and increasing tension disturb glandular function, the mucous membrane is irregularly swollen and dull, its folds are less distinct, and there is a patchy loss of surface epithelium, while layers of new cells are laid down beneath as a result of continued irritation. Analogous changes occur in the infected posterior urethra; the verumontanum is engorged and soft and the prostatic and ejaculatory ducts ringed with inflammation, and more or less occluded. It is true that a steel may, and does, expose an infective focus here and there as it traverses the urethra, but its real importance is the circumstance that it meets the first therapeutic indication in chronicity—namely, stimulation. After a preliminary blanching the urethral lining becomes congested, leading to a lively flare-up of the previously sluggish infective process. These symptoms decline after a few days' retrograde lavage, and with the ebb-tide some recession of the underlying inflammatory condition takes place. The next steel awakens less reaction, a third still less, until finally upon total resolution meatal discharge ceases, the urine clears, and the patient is pronounced clinically well.

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[1] Kohnstam, G. L. S., and Cave, E. H. P.: Radiological Examination of the Male Urethra. London. 1925.

The post-gonorrhœal "morning drop," whatever its bacterial content, is always suspect. It has led abruptly to the divorce court; a longer and well-worn path ends at the gynæcologist's. Treatment of the male gonorrhœic should be continued until subjective and objective signs of the disease have completely disappeared, the five-hour urine is perfectly clear, and white cells are no longer recoverable in significant numbers from the genito-urinary tract. After two months the complement-fixation test should be declining in strength or negative, and if the patient also registers a gain in weight his future may be regarded with confidence.

Clinical and Laboratory Notes.

THE TREATMENT OF MALIGNANT TUMOURS WITH RADIUM CATGUT.

BY DR. EUGEN JOSEPH,
PROFESSOR OF SURGERY IN THE UNIVERSITY OF BERLIN.

THE beneficial influence of radium on malignant tumours is probably greatest when the radium is most evenly distributed and left for the longest possible time in the body or the tumour itself. Various methods have accordingly been invented by which radium is implanted in minute tubes throughout the substance of the tumour, especially when there is no prospect of a permanent result from operation. Implantation has therefore been chiefly employed in carcinoma of the bladder, either alone or after operation. The methods in use have the drawback, however, that the seeds are usually extruded from the tissues.

It is highly probable that the effect of radium is more powerful and lasting if the radium is introduced into the tissues themselves than if it is simply applied to the surface in the neighbourhood of the tumour, when the rays in the overlying tissues are bound to exhaust much of their strength. For this reason radium has given its best results in quite superficial tumours of the skin and of the subcutaneous cell tissue, such as telangiectatic nævi and papillomata of the skin. When radium is left in the tissues after partial or complete removal of the tumour, its effect becomes very much greater. Radium needles buried in the tissues are employed for this purpose, but they have the disadvantage that they are foreign bodies with an irritant action on the tissues and must therefore be removed after a certain time. They are, in fact, often extruded spontaneously. The mesothorium needles in common use at the present time remain in place well, but have not nearly such a powerful action as radium itself.

The retention of radium in the tissues has its own dangers. Rats die a certain time after being injected with a quantity of radium salts, and it is known that the largest quantity of radium which a person weighing 70 kg. can tolerate without grave danger is less than half a milligramme. This is probably why, apart from its expense, the method of leaving radium in the body, except in needles, has not been adopted. Nevertheless, it is undoubtedly possible by this means to prevent a certain proportion of recurrences and local recurrences of the growth. If, for example, the abdominal wall were sewn up after the removal of a tumour with radium catgut or radium silk, the stitch infections which occur so commonly in this region and in the soft parts of the extremities after the removal of a sarcoma or carcinoma would in all likelihood be avoided. Radium catgut is better than radium silk because it is absorbable. The radium should be so distributed over the gut that the dose in the length to be used shall not exceed half a milligramme. The efficacy of the method is shown by the following clinical observation.

The patient, a man aged 25, suffered from an extensive inoperable adenocarcinoma of a kidney. The tumour was about the size of a child's head and was surrounded by glandular metastases, one of which was the size of a normal kidney. I was nevertheless able to remove the tumour and some of the metastases together, but I had to leave the remainder, partly because their removal would have made the operation dangerously long considering the very weak condition of the patient and partly because they were technically inoperable on account of the adhesions they had formed with the large vessels. As I expected a considerable amount of hæmorrhage from this large parenchymatous wound I did not close the incision completely, but packed it with gauze in order not to leave too large a cavity. A few stitches were inserted in the overlying soft parts to keep the gauze in place.

It was easy to foretell that the wound would not close for some time and that the tumour would grow again from the remaining lymph glands and rests. This, in fact, took place. The cavity showed no signs of healing and looked like every other wound from which a large malignant tumour had been partially removed. There was no prospect of inducing it to heal by the ordinary methods. The tumour began to grow again like a fungus and, since it had no skin covering, to ulcerate and suppurate.

The condition was so desperate that I thought it worth while to try the effect of a "secondary" suture with catgut which had been steeped in radium substance. This was a pure experiment and I knew very little about either the preparation of catgut with radium or the proper manner in which to apply it. A certain amount of radium was certainly wasted, which was probably rather a good thing, for we had used 3 mg. of radium substance for about a metre and a half of gut. I closed the walls of the cavity with a purse-string suture, using about half a metre, and the fact that I did not use more prevented my exceeding the limits prescribed by Gudzent. Even so the patient showed very marked symptoms in the course of the next few days. He felt unwell, had no appetite, and was very excited and weak. After about a week these symptoms disappeared; moreover, the desperate condition of the wound began to improve. Apart from the fact that the surface had been drawn closely together with the purse-string suture, secretion gradually diminished; vigorous red granulation set in, although no other treatment was given, and the wound closed completely and healed over. The patient was discharged to his home apparently cured. I am fairly certain that without this procedure a fungoid, putrescent, ulcerating tumour would have formed in the wound and killed the patient in a short time, either by eroding the vessels or by exhausting his strength. Naturally I am doubtful whether he will remain well, but it is certain that if I had not performed the operation and followed it with the radium suture he must have succumbed.

Treatment with radium catgut can be carried out in a number of ways: the tumour may be excised and the wound closed with radium catgut, or an inoperable tumour may be threaded across and across with lengths of radium catgut, the dosage not exceeding 0·5 mg. The latter method is only applicable to inoperable tumours. It is not without its dangers, for cancer patients are usually in poor general condition. The surgeon should, therefore, both prepare the catgut and apply the treatment himself. The method is far more difficult than deep irradiation and should not be left to an unqualified person.

Another consideration is the cost of the material. Estimating the amount of radium used at half a milligramme at the most, and remembering that some of it must inevitably be lost, it is necessary to start with at least one milligramme, which costs £10; moreover, the radium remains finally divided in the body and cannot be used again on other patients. And thus the method is unfortunately inapplicable to all cases of carcinoma. When cost forbids the use of radium, the catgut may be prepared with other substances which are unfavourable to the growth of tumours. Carl Lewin has introduced a compound which he calls "Introcid," a combination of iodine and cerium, one of the heaviest metals, with which catgut can be impregnated and which is considerably cheaper. Nevertheless, I shall continue whenever possible to treat inoperable tumours and the site of operation with freshly prepared radium catgut, and I expect a considerable degree of success and prolongation of life in cases which could not be benefited without the introduction of radium into the tissues. I have hopes that this method may prove a valuable standard auxiliary to the operative treatment of cancer in general.

A CASE OF

PERNICIOUS ANÆMIA NOT RESPONDING TO LIVER TREATMENT.

By A. C. Hampson, *M.C.*, M.D. Camb., M.R.C.P. Lond.,

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In The Lancet of Nov. 2nd, 1929 (p. 935), in an annotation on a paper by Dr. P. Emil-Weil (*Le Sang*, 1929, iii., 426), the question is raised: "Are there any cases of pernicious anæmia which will not respond to liver?" Pointing out that we have at present three criteria of pernicious anæmia—namely, achlorhydria, hæmolysis, and an increase in the mean size of the red cells—the annotation says that as Dr. Emil-Weil gives no information on the last two points "it would be rash to amend the aphorism that anæmia which will not respond to liver is not pernicious anæmia."

The following case, which has been under continuous observation at Queen Mary's Hospital for over two and a half years, is of interest in that it shows all the criteria mentioned yet has not reacted to liver treatment, though very large doses have been given.

A man, aged 50, first complained of giddiness in 1925. He was treated by his doctor for anæmia for some months. In October, 1926, he had 14 teeth extracted, and the extraction was followed by considerable hæmorrhage. From that time he had become progressively weaker. He was sent to Queen Mary's Hospital on Feb. 25th, 1927. On examination he was found to be a well-covered man, very anæmic, with a lemon-yellow colour of the skin. The spleen was palpable. His few remaining teeth were septic.

Examination of the blood showed: hæmoglobin, 32 per cent.; red cells, 1,600,000; white cells, 4200; polymorphs, 30 per cent.; lymphocytes, 68 per cent.; eosinophils, 2 per cent. Platelets were few. The mean diameter of the red cells was 8·2 μ, and the Price-Jones curve showed the typical distribution of pernicious anæmia. The cells themselves showed considerable variation in size and shape. Van den Bergh's test showed a negative direct and a positive indirect reaction. A fractional test-meal revealed a complete achlorhydria. Examination of the fæces for parasites gave negative results, and otherwise the stools appeared normal.

The remaining teeth were gradually extracted, and associated with this and treatment other than the administration of liver the blood condition showed slight improvement. Two blood transfusions were done, and at the beginning of August, 1927, the hæmoglobin had risen to 70 per cent. A fortnight later it had fallen to 50 per cent. Liver treatment was then commenced, and has since been given without interruption. This treatment produced no immediate rise in the value of the hæmoglobin, though later there have been periodic rises, apparently quite independent of the treatment. Taken as a whole the level of the hæmoglobin has become progressively lower, being at the present time 25 per cent. A consideration of the blood examinations suggests that the liver diet may have produced a temporary fall in the colour-index during the first few weeks. During the same period the mean diameter of the red cells became less (but still above normal). Such variations occurred in other cases before the days of liver treatment, and that this result was at all events only temporary is shown by the fact that since March, 1928, the colour-index has never been below 1·1, while at times it has been as high as 1·4.

The test-meal and the van den Bergh reaction have been repeated several times with results similar to those recorded above. On several occasions it has been necessary to resort to transfusion. In July of this year he was found to have pus in the ethmoidal cells. This has been dealt with without improvement of the condition of the blood. The patient's weight has been well maintained throughout the whole period. The liver for this patient's diet was prepared in the same way as that used for other patients suffering from pernicious anæmia who have been in the hospital during the last two and a half years. The other patients readily responded to treatment.

The majority of the investigations recorded above were conducted by Dr. Arthur Davies and Dr. L. Hewlett, to whom I am much indebted.

INTERNAL SPLINTING FOR FRACTURES.

By R. E. Pascal,

INTERNE DES HÔPITAUX DE PARIS.

It is well known that efficient immobilisation offers the best means of relieving the pain of fractures and of ensuring bone consolidation. Absence or delay of bony union is due to various factors, known and unknown. An examination of radiograms shows that there is a correlation between these defects of repair and the peculiar rarefaction and loss of calcium known as osteoporosis. This condition is often seen after operations on the skeleton, especially when two bony fragments have been united by a piece of metal. The metal has naturally been blamed, but osteoporosis may appear in one case and fail to appear in another when the conditions seem identical.

Robineau and Contremoulins,[1] after long study of the modifications in bone seen radiologically after operations for fracture of the neck of the femur, have established certain biological laws which may be summarised as follows. Osteoporotic changes do not occur after splinting with beef bone or non-oxidisable metal: (1) when the splints have been mounted and fixed in strict accordance with the laws that a first-class mechanic would apply in setting up a delicate piece of mechanism; (2) when the splints have been calculated to withstand the strain to which they will be submitted; and (3) when the splint and the pieces of bone which it unites are not submitted to premature mobilisation or any disturbance which might compromise the good position originally obtained.

This is quite a new conception; an example will make it clear.

A fracture of the neck of the femur is treated surgically and all goes well. The patient gets up too soon and disturbs the neighbourhood of the fracture, which is not yet completely consolidated. A few days later he has some pain and X rays show commencing osteoporosis around the screw. If the injured limb is again immobilised, the pain and the osteoporosis soon disappear and full consolidation is obtained.

The results got by Robineau and Contremoulins afford the best proof of the importance of absolute fixation of bony fragments and splints in order to prevent any change in the bony tissue.

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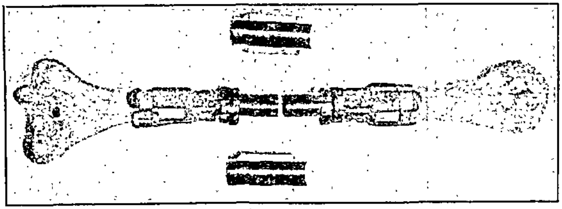
[1] Robineau, M., and Contremoulins, G.: Note presented by Dr. Bazy, Compt. rend. Acad. des Sci., 1925, clxxx., 1543.

Devices used by Robineau and Contremoulins.

For repairing the shafts of long bones they do not use the strips of Putti and Parham nor the plates of Lambotte and Shermann, because from a mechanical point of view these do not offer sufficient resistance. On the principle that a given mass is stronger when disposed as a hollow cylinder than in any other form, they constructed sheaths to enclose the broken bone completely and to grasp it tightly. The length of the sheath depends, of course, on the size of the bone, the direction of the fracture, and the number of the fragments. Correct adjustment is easy, for the sheath only needs fitting and tightening. No other immobilisation apparatus is required, even for a fractured femur. The joints may be moved a few days after operation, and bony union is secured earlier than after bloodless operation or other surgical techniques.

FIG. 1.

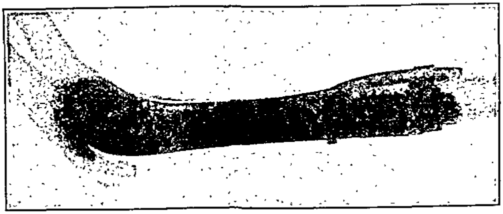


Bronze sheaths used for joining separated fragments of bone.

After arthrodesis and resection of the knee-joint, when ankylosis is desired, Contremoulins and Robineau fix the tibia to the femur by two beef bone screws set crosswise. Here again no immobilisation is required, and 45 days after the operation the patient can walk about and resume active life. His period of convalescence is thus halved. There is considerable difference between healthy and diseased bone; in resections for tuberculosis the bones are generally decalcified and soft and the correct placing of screws is very often impossible. Osteoporosis, which never appears in perfectly healthy bone, may then occur round the screws, but so far it has always been too limited to retard bony union.

The long metallic sheaths used for fractures had proved that the Durville bronze used was quite well borne by the tissues. Only three times during eight years had it been necessary to remove the sheath, and healing had been obtained without disturbing it in infected suppurating fractures. Contremoulins and Robineau thought, therefore, that they could safely enclose the bones in an even more massive material. After subtrochanteric osteotomy of the femur two independent pieces of metal are screwed into the two fragments; the screws are split longitudinally and the points separate in the medullary cavity, thus acquiring a very strong hold (Fig. 1). The two pieces of metal are then joined by a gear-toothed articulation, which allows the surgeon to correct any faulty alignment and put the limb into the correct position before the device is locked. A bone graft is added to the metal splint to ensure bony union. The patient can leave his bed six to eight weeks after operation without ever having been in an immobilising apparatus. There is no fear of secondary deviation or a return of the original deformity.

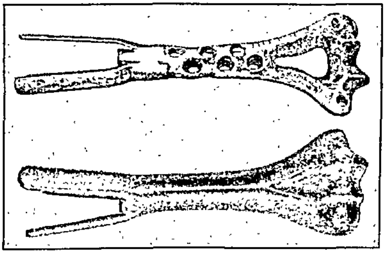
FIG. 3.



Radiogram, taken five years later, showing the substitute (see Fig. 2) in position.

Finally, Contremoulins and Robineau have solved the problem of treating cases in which there has been considerable loss of bone substance. Their first case was treated four and a half years ago. The lower third of the humerus was replaced by a mechanical device made of steel covered with dentist's rubber (Fig 2). Success depended on secure union between the prosthetic device and the bone. To this end a steel dowel covered with ebonite was driven with great care but considerable force into the medullary cavity of the resected humerus. To prevent splitting as a result of violent lateral movement, three processes mounted on the prosthetic piece were screwed to the surface of the humerus and held in place by a ring of aluminium bronze (Fig. 3). Repeated X ray photographs failed to reveal any osteoporosis; indeed, after two years there was a slight condensation of the humerus around the metal. The patient has full use of his arm, works as an errand man with a tricycle, and plays the banjo.

FIG. 2.



Steel substitute for lower third of the humerus (covered with dentist's rubber).

The mechanical adjustment of metal devices constitutes a new surgical method which will have many difficulties to overcome, for it can leave nothing to chance. Each case requires elaborate investigation. X ray measurement of bone,[2] special design of pieces for their particular duties, a carefully prepared scheme of operation which must be strictly followed, a peculiarly thorough sterilisation—especially of rubber-covered devices—and rigorous asepsis. These difficulties are of little importance when weighed against the benefits of retaining a limb otherwise doomed to amputation, and of restoring functional activity in a case where all the classical operations would fail. There is still scope for advance. It may be possible in time to replace an entire bone with metal, and to make a complete joint endowed with normal movement.

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[2] Contremoulins, G.: Arch. d'Elect. Méd., 1901; Ann. d'Electrobiol. et de Radiol., 1904, Nos. 5 and 6; Presse Méd., 1923, Nos. 74 and 78.

Results.

The sheaths or sleeves for repairing fractures of bone shafts have given excellent results since 1921. In only three out of over 100 cases thus treated have they had to be removed, and this was done very easily. Many of the patients had compound fractures but this did not prevent sound consolidation. The sheaths are quite well tolerated and I have never observed pseudarthrosis. The callus grows inside and outside the sleeve; on the femur very extensive callus-formation may be seen outside the sleeve. The big internal splinting devices set by us have never yet had to be removed, though it is now more than five years since the first case was treated in this way.

Medical Societies.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

AT a meeting of this Society on Dec. 20th, with Dr. J. J. BUCHAN, the President, in the chair, a discussion on the

PUBLIC HEALTH SERVICE AND ITS FUTURE

was opened by Prof. H. R. KENWOOD. He began by saying that the goal of the Public Health Service was distant but clearly defined. It was represented by a future in which the mind of the public should be attuned to public health precepts and practice; in which general practitioners would be concerned with public health measures of preventive medicine; and in which there should be the maximum efficiency of administration with the minimum of overlapping. That there were flaws and gaps in the present scheme no one present need be reminded; as an illustration he would mention the tuberculosis system, which was poorly organised for control of early cases and for after-care, but which was responsible for such excellent work in the intermediate stages. The need here was for earlier diagnosis and treatment and more efficient after-care. To give an illustration in another direction, Sir George Newman stated that at 5 years of age a quarter of the children entering school required medical attention. At present the public health scheme lacked completeness and comprehensiveness. A national scheme of health education was required, in which the Society would play an important part, and such a scheme would depend largely on the coöperation of the family doctors; no services should be undertaken by the health authorities which the general practitioners were able and willing to carry out. On the other hand, it was essential that general practitioners should be imbued with that understanding of preventive medicine which at present they lacked. Experience of general practice was essential to a public health official, and the National Health Insurance scheme gave opportunities for coöperation between panel doctors and local health authorities.

Status of the Public Health Service.

The efficiency of the public health service, as well as its status, depended on the quality of those who entered it. At present there was disappointment and discontent among the assistant medical officers of the service, owing to the insufficiency of the salaries offered by the local authorities. Only a few of the workers could hope to become heads of departments, and many of these had been in office for years without hope of improving their prospects. As a rule an assistant medical officer had no hope of promotion unless his chief retired; applications for senior posts elsewhere usually resulted in disappointment, owing either to local competition or because the experience of the applicant was considered to be "too narrow." An assistant medical officer began work at a salary of £500 or £600 a year; after eight years he might rise to £700; and after another five years the local authorities had it in their power to consider whether they would augment his salary or not. In any case it should be made clear that this only covered certain defined duties, and anything outside those duties should receive extra remuneration. Medical officers of health should allot as many duties as possible to members of their staffs, in order to give them opportunities to raise their salaries, augment their experience, relieve the monotony of their work, and increase their chances of obtaining better posts. Medical officers of health were overloaded with administrative work, and should delegate work outside the office to assistants. He had heard them accused of missing admirable opportunities for research, but the truth was they had no time. He would urge all medical officers of health to take every opportunity of bringing the work of their assistants before the authorities; this course raised the quality of the team work and helped juniors to obtain better posts. A new superannuation scheme was required; officers should be able to serve more than one public body without loss of superannuation. Also he would protest against the age-limit at 40 years, a period at which officers were most valuable in point of experience.

Prof. W. W. JAMESON said he would like to refer to the past; it was only 50 years since the local sanitary authorities had been put under statutory obligation to appoint public health officers, and they had as a rule appointed the local poor-law medical officer, who knew nothing of preventive medicine. Forty years ago the county and county borough councils had come into being; but public health service as it is to-day dated from 1907. In 1919 and 1920 many new appointments were made, until now there were 1500 to 1600 whole-time medical officers in England and Wales, of whom only 360 were medical officers of health. For some time past a campaign for higher salaries for assistant medical officers had been in progress. Advances had been made in the work and difficulties overcome; as a result of the Local Government Act, coming into force next year, the medical officers of health would be able to coöperate on a larger scale with the local authorities and with voluntary hospitals in their districts. The public health service was the only service requiring a special post-graduate degree in its members, and students in hospital were at present instructed too little in preventive medicine. At the present time welfare and maternity posts were often filled by persons lacking the diploma of public health, while their junior unqualified assistants had done a six-months course in this subject. Districts had formerly been much too large for adequate administration by the medical officer of health, and this was still the case to some extent; thus one area consisted of 15 districts and 500 square miles, without provision of travelling facilities. Prof. Jameson thought that some part-time posts might be occupied by general practitioners, in order that they might have a direct and practical interest in the work. He agreed that there were plenty of opportunities for research but too little time. The opening of the new School of Hygiene, with a Government guarantee of adequate support, was significant of the interest which preventive medicine was awakening.

Discussion.

Dr. A. K. CHALMERS said that the new Act was the opening of a new scheme; to retain the best men in the service salaries should be scaled. The opportunities for research were wide and not confined to the laboratory. Diphtheria was more prevalent in

Scotland of late years, while scarlet fever, though at present of a mild type, appeared to be unaffected by public health activities. These offered two interesting fields for investigation.

Dr. T. SHADIK HIGGINS (Cape Town) described the present position of South Africa with regard to public health. The scheme, he said, was modelled on the British service, but did not control the school medical case, and had no connexion with poor relief work. The work was complicated by the existence of a white colony and a large half-breed community, as well as the native inhabitants. The death-rate among the half-breeds or "Cape coloured" cases was much higher than among Europeans, as was also the susceptibility to tuberculosis. He attributed their condition to insufficient wages.

Dr. E. T. NASH said that in reply to a questionaire sent by post to assistant medical officers in the service he had ascertained that the average age of these members was 39½ years, that 63·5 per cent. were married, and that few had a salary exceeding £700 a year. There was a 1 to 9 chance against any of them becoming a chief, and many had children to educate. Consequently the service was a disgruntled one. He considered that general practitioners might do part-time work in the service, but he had inquired among practitioners in his division of the British Medical Association and only two had been willing to undertake the work, both of whom were newly established. He suggested that a census should be taken of members of the service.

Dr. W. G. WILLOUGHBY said it was unfair to lead junior members of the profession into a blind alley. He did not agree with the idea of a scale, but thought the maximum salary should be open to allow the best worker full prospects.

Sir THOMAS LEGGE said he spoke from the industrial aspect. He had hoped to hear something at the meeting of the Factories Bill, but the Local Government Act was evidently of more importance at the moment to the Society. He regretted that so much of the discussion had been concerned with the pay. In his experience the poorest paid generally worked best. As a Society they should attempt to get rid of their extreme sensitiveness; the slightest criticism of their work was apt to provoke a storm.

Dr. G. F. BUCHAN said that the work of the service was enormous, and extremely attractive to the worker entering it. The opportunities for research were considerable, and the only reason for discontent was the limitation of salary. He thought promotion should be arranged on the plan followed among the clergy, and not as at present, where the local assistant was usually promoted into the vacant senior office. He did not see how the general practitioner could be worked into the scheme, or what offices he could perform.

Dr. W. G. BOOTH said that if the minimum salary were fixed at £700 a year, he thought the authorities would pay it. He considered the Society should look ahead. Was it to become a State service? If so, now was the time to fix salaries on a suitable scale.

The PRESIDENT said that medical officers of health nowadays were purely administrative; they did not interfere with the welfare or tuberculosis staffs if the work was well done, and the same would apply to factories should they come under the control of the service. The members of the service were in no sense grasping; it was in the interests of the health of the general public that they appealed for reasonable conditions of work. As to being sensitive, no one could occupy a public health office for so much as a year if he had not the hide of a rhinoceros. Disregard of criticism was quickly acquired.

Dr. ANDREW BALFOUR said that the new London School of Hygiene hoped to supply "refresher" courses, and to help the workers in the public health service to keep abreast of advances in research.

MANCHESTER MEDICAL SOCIETY.

AT a meeting of this Society on Dec. 4th, 1929, with Dr. A. RAMSBOTTOM, the President, in the chair, a paper on

Sensitisation Associated with Eczema and Trade Dermatitis of the Eczematous Type

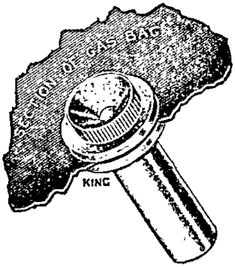
was read by Dr. WILLIAM DYSON. These two conditions, he said, were clinically and histologically indistinguishable. Their liability to relapse was well known, and if the attacks were prolonged or often repeated a general sensitisation of the whole skin might arise. When a sensitisation was established the skin would react to any external irritant. In Dr. Dyson's opinion the cause of this sensitised state must be looked for in some change which had taken place in the individual. He suggested that this change was brought about as the result of the absorption of the products of inflamed or damaged epithelium which set up a condition of hypersensitiveness—"an anaphylactic state." He showed that in non-discharging pruritic dermatitis a high blood-sugar was to be expected, whereas in cases which were discharging the blood-sugar content was lower, suggesting that when the products of inflamed epithelium were absorbed a high blood-sugar was to be expected, whereas when these products were being discharged on the surface the blood-sugar content was less. On the supposition that sensitisation was an anaphylactic state, he had treated 15 cases of eczema and eczematous trade dermatitis with injections of their own blood, with a view to producing and keeping them for a long period in an anti-anaphylactic state, and in this way desensitising the patient. In 10 out of the 15 cases the treatment had been successful in clearing up the dermatitis, and only one of these ten cases had relapsed up to date.

Dr. W. J. RUTHERFURD read a paper on Small-pox in Pre-Norman Britain.

New Inventions.

ETHYL CHLORIDE INHALER.

WHEN administering ethyl chloride one requires a special inhaler unless the "open method" is adopted. It has occurred to me that if a fitting could be incorporated in the usual dental N_2O bag the necessity for extra apparatus could be avoided. I have therefore devised a simple apparatus to this end, by adapting the spring ball valve of Looseley's inhaler to a flanged metal tube that can be fixed to any ordinary gas-bag, without taking up additional space. When attaching this fitting (shown by the illustration) all that is necessary is to punch a ⅜ inch hole in the bag, preferably near the stop-cock where the rubber is doubled. The advantages of this fitting are mostly obvious in juvenile dental patients; it is inexpensive, and can be fitted to any existing gas-bag.



Messrs. A. Charles King, Ltd., 34, Devonshire-street, London, W., are the makers.

GERALD MORIARTY, M.D. Edin.

Reviews and Notices of Books.

PRINCIPLES OF BACTERIOLOGY AND IMMUNITY.

By W. W. C. TOPLEY, M.A., M.D., M.Sc., F.R.C.P., Professor of Bacteriology and Immunology, University of London, London School of Hygiene and Tropical Medicine; and G. S. WILSON, M.D., M.R.C.P., D.P.H., Reader in Bacteriology and Immunology in the same School. London: Edward Arnold and Co. 1929. 2 vols. Pp. 1300. With 242 illustrations. 50*s*.

THIS book is one which we feel sure will receive a cordial welcome from all practising bacteriologists and teachers of this subject. The authors have for some years been engaged in teaching bacteriology, as a post-graduate subject, for the diplomas of the universities of Manchester and London, and the present work is the outcome of their experience, being based upon the course of study which they now give in the London School of Hygiene and Tropical Medicine.

The book consists of two volumes each of some 600 pages. The first of these is an up-to-date text-book of bacteriology in which the conventional arrangements are generally followed; whilst the second treats in detail of the reactions between the body and bacteria—i.e., infection and the immunity phenomena. Taking these volumes separately, for in effect they are almost distinct, we note that the first consists of two sections, in one of which historical, morphological, and physiological considerations are dealt with. No attempt has been made to set out cultural and tinctorial methods at any length, and in our opinion Prof. Topley and Dr. Wilson are wise in this bold exclusion, since there are already numerous special works on these subjects. The historical outline is an admirably concise and accurate review of the evolution of bacteriology, whilst the chapter upon physiology is admirably lucid and includes an honest attempt to correlate what is known of bacterial metabolism with current knowledge of enzyme action and other general biochemical phenomena. Bacterial variation is described clearly, but condensation has made the facts appear simpler than they really are. The systematic treatment of bacterial species, which occupies the second half of this volume, is orderly and convenient; the same group of properties being described seriatim for each organism. This arrangement will be much appreciated by students and makes for ease and rapidity of reference. The nomenclature used is that of Bergey, with inconsiderable modifications; the authors admit no great love for this terminology but adopt it (for want of better) as being at least a reasonable advance upon the irrational pre-war usage.

The second volume is also divided into two parts, of which the first deals with infection and resistance, and the second with the applications of bacteriology to medicine and hygiene. It really forms a separate text-book upon infection and immunity. Thus, whilst the actinomyces occupy Chapter XII. in Vol. I., the disease, actinomycosis, occupies Chapter LV. in Vol. II., and the same holds good for other organisms and the infective condition to which they give rise. It might be imagined that this arrangement, which is no doubt the outcome of experience in teaching bacteriology as a pure subject, would lead to considerable overlapping; and the impossibility of entirely preventing this is freely admitted. But so much care and judgment have been exercised in the segregation of material that we have sought in vain for serious evidence of this defect. In some places the line has obviously been difficult to draw. The serum reactions find themselves in Vol. I., whilst a consideration of animal immunity and the humoral antibodies is in the second volume. In general, there is a good deal to be said both for and against this arrangement, but the successful way in which Prof. Topley and Dr. Wilson have overcome its inherent disadvantages forms a strong argument for its use.

It is scarcely possible here to discuss more than a few sections of the book, but we note that adequate but not disproportionate consideration is given in Vol. II. to the special work of Topley and his associates upon experimental epidemiology and herd immunity. The laboratory diagnosis of enteric infections is considered in great detail, the authors pointing out that non-recognition of the diphasic character of the salmonellas invalidates the assumptions upon which Dreyer's standards were adopted, and, further, that there has been no general adoption in routine diagnostic practice of the contributions of Andrewes and White to our knowledge of antigenic structure; one consequence being that O agglutination is in general absent with "standard" formalinised suspensions. The "Widal" test, as recommended by the authors and devised to detect both H or O agglutinins for the common types of enteric infections, involves the use of no less than nine suspensions. This theoretically desirable complexity means that such tests, to give accurate and full information, can only be carried out in a well-equipped and well-staffed laboratory or, alternatively, that the clinical pathologist in smaller centres must become completely dependent upon the larger institutions for the supply of his reagents.

The authors' researches into the literature have evidently been both extensive and critical, and whilst they do not seem to have neglected any contributions of serious merit they have avoided the mere catalogue of other people's opinions—sometimes entirely contradictory—which is a common and unfortunate feature of many modern pathological and bacteriological books.

There is much in these volumes to commend and little to criticise. The material dealt with has been well digested and is summarised and presented in an orderly and easily assimilable form, and in far greater detail than in any English or American text-book of reasonable size with which we are acquainted. Most of the outstanding problems of bacteriology are courageously tackled; the issues are clearly and frankly set out and the authors' general conclusions are presented with a happy combination of dogmatism and judgment. The inquirer is rarely left in the air; usually he is presented with some sort of working hypothesis even if this is admittedly a temporary one. The book is a notable production and illustrates well the high level of bacteriological practice and teaching now attained in our universities.

EFFECTS OF MOISTURE ON CHEMICAL AND PHYSICAL CHANGES.

By J. W. SMITH, B.Sc., Ph.D. London: Longmans, Green and Co. 1929. Pp. 235. 15*s*.

LIFE is impossible without water, and yet the study of extreme dryness may be of great interest to the biochemist, since the catalytic effects of water can only be demonstrated by careful dehydration. This book is a summary of our present knowledge of the influence of traces of moisture on chemical and physical changes, and therefore deals principally with the "abnormal" behaviour of very dry substances. Many of the results described will surprise the purely medical reader, as also will the extraordinary precautions which are necessary in the doing. For example, everyone knows that iron will not rust in dry air, but the fact that potassium can be distilled unchanged in very dry oxygen is not so familiar. Indeed, the most striking characteristic of water as a catalyst is the very large number of reactions which it affects. Of more than a hundred which have so far been studied only a few have given negative results, and examples of every type of chemical reaction have been shown to be stopped, or at least retarded, by thorough drying. In the case of physical properties the general nature of the effect is even better established since *all* the liquids and solids so far investigated have shown some change in physical properties after intense desiccation. The work of H. H. Baker is a good example of the care needed to obtain positive results.

He sealed up a number of liquids in glass vessels with phosphorus pentoxide and left them for eight years from 1913–21. At the end of this time he found that the boiling points had risen considerably; for example, alcohol boiled at 138° C. instead of at 78·5°C.

A very large number of theories have been put forward to explain aqueous catalysis. Those best known in biochemistry assume the formation of an intermediate compound and have been used especially in the case of biological oxidations; as an example we may recall Traube's theory, in which hydrogen peroxide was the compound selected. Such theories are justly criticised by the author on the ground that they are not of sufficiently general application. More space is devoted to Smits's theory, which is not open to this objection, and which is supported by considerable experimental evidence. Smits assumes that a substance exists in two or more forms in equilibrium with each other. Only one of these is chemically active, and the equilibrium is "frozen" or actually displaced in the direction of the inactive form by the removal of water. The different forms have different physical properties, and can be separated by fractional distillation of the very dry substance, a feat which has actually been accomplished in the case of sulphur trioxide. Smits's theory also appears to supply the best explanation of the way in which extremely small quantities of water may act, since the fraction of the total molecules existing in the active state is about 10^{-10} and the fraction of water molecules necessary for the activation of a completely inactive system is of the same order. An interesting chapter is included on the influence of traces of other catalysts on the physical properties of liquids. When liquids are sealed up with solid catalysts such as platinum black or charcoal, changes in the vapour pressure, surface tension, and density have been demonstrated. These are explained in a similar fashion to the above, a shift in the inner equilibrium between the smaller and larger molecules being assumed.

The book is well written and the subject is ably presented. The historical introduction and the diagrams in the text are features of special value, and the author is to be commended for his refusal to sacrifice accuracy to simplicity. He is careful to avoid making dogmatic statements, and succeeds in giving an unbiased account of the many controversies which have arisen; if the result is slightly confusing in places this is to be attributed to the unsettled state of the subject, which provides ample justification for his impartial attitude. The book will be read with considerable interest by biochemists, if only because it reveals how little we know of catalysis in general, and of the catalytic action of water in particular. At a time when the study of the action of water on pure substances has only just begun, we should not be surprised at the difficulty of assessing its rôle in the living body.

NOSE, THROAT, AND EAR.

A Manual of Diseases of the Nose, Throat, and Ear. Sixth edition. By E. B. GLEASON, M.D., LL.D., Professor of Otology, Medico-Chirurgical College, University of Pennsylvania London and Philadelphia. W. B. Saunders Company. 1929. Pp. 617. 21s.

THIS well-known manual was first publised in 1907. In these two and twenty years there has been much progress in the science of otolaryngology. Though the book has become somewhat large with each edition, it has nevertheless suffered a little from compression; the print is rather close, and the illustrations, especially those of pathological subjects, too small. A more rigorous exclusion of obsolete matter, such as the removal of septal spurs with the saw, would help to solve the difficulty of lack of space. Misprints and errors of grammar are too frequent.

The book is full of information derived from a ripe experience and well deserves its popularity.

TROPICAL MEDICINE.

Krankheiten und Hygiene der Warmen Länder. A Practical Text-book. Third edition. By Profs. Drs. REINHOLD RUGE, PETER MÜHLENS, and MAX ZUR VERTH. Leipzig; Georg Thieme. 1930. Pp. 496. M.39.60.

THE general format of this out-standing text-book remains the same, and although a large amount of additional information has been compressed within its bulk, mainly by the liberal adoption of small type and slightly larger pagination, the total increase is but five pages over the original. It differs from English text-books on tropical diseases in that much space is devoted to the consideration of the usual subjects of tropical climate, acclimatisation, nutrition, and general adaptability to tropical conditions. A good deal of this information is based upon somewhat debatable data and much is the outcome of ordinary common sense. The metabolism of the human body is necessarily disturbed by exposure to tropical conditions, but the adaptability of the human organism is so great that much more detailed biochemical work will have to be undertaken before these variations can be placed upon a strictly scientific basis. We may note amongst other minor changes a small section devoted to surgery in the tropics. The advisability of this inclusion is questionable, for a large subject is treated in an abbreviated and rather stilted manner. The number of excellent coloured plates remains the same though the text-figures are increased to the number of 40. A whole plate is devoted to microphotographic reproductions of malaria parasites (from Kolle and Wassermann), which, however admirable, do not by any means approach in teaching value the black-and-white drawings or coloured figures. The production of this edition is a testimony to the continued vitality of tropical medicine in Germany.

Hookworm Disease: Its Distribution, Biology, Epidemiology, Pathology, Diagnosis, Treatment, and Control. By ASA C. CHANDLER, M.Sc., Ph.D., Professor of Biology, Rice Institute, Houston, Texas; recently Officer-in-Charge, Hookworm Research Laboratory, School of Tropical Medicine and Hygiene, Calcutta, India. London: Macmillan and Co., Ltd. 1929. Pp. 494. 21s.

HOOKWORM disease is one of the most widespread and devastating of all ills. Its literature is so scattered that one who undertakes to compress it into reasonable compass deserves gratitude. Dr. Asa Chandler, who is an authority of international standing, has done the work admirably well. Our knowledge of the biology and morphology of *Ancylostoma duodenale* is still based upon Loos's exhaustive work published in 1911; but since that time great advances, thanks mostly to the energies of the Rockefeller International Health Board, have been made in the direction of prevention and treatment, and it is from this aspect of the subject that the practical medical man will derive much assistance from a study of Dr. Chandler's monograph. According to Dr. Chandler, thymol and beta-naphthol treatment have been definitely replaced in hookworm therapy by oil of chenopodium and carbon tetrachloride. Oil of chenopodium, he states, has advantages over the two first-named drugs in its safety and simplicity of administration, and also in its further advantage of being effective against ascarids and other intestinal nematodes. Carbon tetrachloride, in his view, outscores oil of chenopodium in about the same degree that chenopodium outscores thymol. In the vast majority of patients he believes it to be quite harmless, produces few or no unpleasant symptoms, and can usually be taken without interference with the day's work. Its cost is so low as to be negligible. Dr. Chandler holds that the combination of carbon tetrachloride and oil of chenopodium, each in reduced dosage, provides an almost ideal anthelminthic.

THE QUEEN CHARLOTTE'S PRACTICE OF OBSTETRICS.

Second edition. By J. BRIGHT BANISTER, M.D., F.R.C.S., ALECK W. BOURNE, M.B., F.R.C.S., TREVOR B. DAVIES, M.D., F.R.C.S., L. CARNAC RIVETT, M.C., F.R.C.S., L. G. PHILLIPS, M.S., F.R.C.S., and C. S. LANE-ROBERTS, M.S., F.R.C.S. London: J. and A. Churchill. 1929. Pp. 635. 18*s*.

THE second edition of "The Queen Charlotte's Practice of Obstetrics" differs little from the first. Such small errors, misprints, and omissions as creep into new books, in spite of the most careful proof-reading, have been corrected, but little new matter has been added. The authors do not claim that the work is more than an exposition of the practice of a famous maternity hospital, teaching which may or may not be generally accepted. This fact disarms criticism, which in any case would be difficult to justify since the authors have produced one of the most practical works on obstetrics in the English language. There is one point to which attention might be drawn. Throughout the book the term "disproportion," which is now so largely adopted in place of such terms as "minor degree of contracted pelvis," is hardly mentioned. Surely the majority of "tight fits" are better regarded and dealt from this point of view. In the same connexion it is to be regretted that the importance of moulding of the fœtal head does not receive greater prominence.

The first edition achieved immediate and well-deserved popularity which is likely to continue.

MAN'S PLACE AMONG THE MAMMALS.

By F. WOOD JONES, F.R.S., Professor of Physical Anthropology, University of Hawaii. London: Edward Arnold and Co. 1929. Pp. 372. 21*s*.

WHEN the conception of evolution was first sprung upon a horrified Anglo-Teutonic world by the work of Darwin and Haeckel, the way had already been prepared by several zoologists who had recognised the varying degrees of differentiation in the animal world and had arranged all known species in scales of increasing complexity. The idea of evolution did little more than give a shake to these rigid schemes and turn the "échelle des êtres" into a moving stairway. At first, therefore, the idea of evolution followed strictly along the lines of this classification, and it was assumed implicitly that the amœba had evolved to man through all the other known animals, and also through a number of intermediate stages which have not survived. As soon as the idea of evolution had been accepted without the prejudice which it first evoked, it became plain to thoughtful biologists that the rigid and relatively simple process described by Haeckel could not represent the truth, and the conception of evolution has been steadily changing ever since from that of a stairway to that of a tree. The tree has many collateral branches, and most of the animals living on the earth to-day are representatives of the extreme tips of twigs, rather than occupants of places on the stem from which other twigs arise; they are, in fact, cousins—often several times removed—and not ancestors or descendants of each other.

So much is admitted by most, but when it comes to applying the principle to man and his nearest relatives, there is still some fairly acute difference of opinion. Prof. Wood Jones stands in the front rank of those who apply this idea whole-heartedly and declare that the problem of man's ancestry is to be studied not among the apes and monkeys, but among simple arboreal mammals. As a result of following up this line of thought he has come to the conclusion that man is structurally a very primitive mammal, much nearer the common ancestors of the mammals than most of the animals we know to-day, but distinguished by the development of his brain and hand and the changes incident on the assumption of the upright position. These views have been put forward in two previous publications—"Arboreal Man" (1916), and "The Problem of Man's Ancestry" (1918)—both of them somewhat hampered by the difficulties of publication and research during the war, and both of them in the form of published lectures. Now Prof. Wood Jones has supported these by the volume under review, which goes thoroughly into all the evidence for his theory and reviews the evolution of biological thought and the anatomical characteristics of the primates in relation to those of man. His conclusions, summarised, are: that the members of the proto-human stock were small, active, agile animals, with legs longer than their arms; that they were already erect and prepared for terrestial life, and that they possessed enlarged crania, small jaws, and moderately large eyes. He vividly contests the picture of the slouching hairy brute with elongated arms, lumbering into a stage of partial uprightness, which is usually drawn as that of the ancestor of man. Like all Prof. Wood Jones's books, this is lucidly and attractively written and illustrated with charming line-drawings of his own and excellent photographs of monkeys and apes from the London Zoo. As he says in his preface, the objections to his thesis are of two kinds: first that it is ridiculous and unwarranted, and alternatively, that it is so generally admitted as to stand in no need of exposition. Whichever point of view the expert may take, he will still need to read this book, and to the ignorant, who do not profess to know all there is to be known about evolution, it will certainly be a delightful review of the ever-absorbing problem of their own ancestry.

RECENT WORK ON COLPORRHAPHY, RHEUMATISM, AND COLI BACILLURIA.

By E. HESKETH ROBERTS, F.R.C.S. Ed., M.B., B.S. Lond., Gynæcological Surgeon, St. John's Hospital, Lewisham. London: H. K. Lewis and Co., Ltd. 1929. Pp. 28. 3*s*.

IN this short monograph the author gives a careful account of the technique he employs for the operations of anterior colporrhaphy and posterior colpoperineorrhaphy. He describes a new layer of the visceral pelvic fascia which runs down the lateral aspects of the rectum and vagina. Recurrence of symptoms is liable to occur after these operations, and the author puts forward his views on the significance of chronic rheumatism and colon bacilluria as ætiological factors.

OUTLINES OF DENTAL SCIENCE.

Vol. XII., *Dental Local Anæsthesia*. By JOHN JAMES, L.D.S., Lecturer in Operative Dental Surgery, King's College Hospital Dental School. Edinburgh: E. and S. Livingstone. 1929. Pp. 127. 7*s*. 6*d*.

THIS is a straightforward account, suitable for senior students or junior practitioners, of the elements of local anasthesia as applied to dental surgery. The book is essentially practical and obviously written by one who has had considerable clinical experience. Mr. James favours cocaine in preference to novocain. He holds the toxicity of cocaine to be negligible and has no fear of engendering drug addiction by its use. Somewhat illogically he bases his preference for novocain in regional injections on its lesser toxicity. We know that many dentists use cocaine as a routine anæsthetic and that accidents are few, but in a book primarily intended for students or junior practitioners such advice may be dangerous. The technique of local anæsthesia is clearly and adequately described. The chapter on novocain dermatitis should prove useful, but for the most part the chapters on complications and contra-indications are rather too brief, since the possible complications of local anæsthesia are numerous and may be serious. Similarly, the contra-indications to the use of a local anæsthetic are of definite importance, and should receive full consideration in a text-book on local anæsthesia.

THE LANCET.

LONDON: SATURDAY, JANUARY 4, 1930.

THE COMING OF RADIOLOGY.

A MODEL on view *at the Charing Cross District* Railway Station takes the lid off the underground system and enables the passenger to visualise the working of the whole system of tubes with their controls and safety devices. RONTGEN's discovery did much the same for the human alimentary canal although he did not live to see to what extent it was to revolutionise medical practice; and indeed the revolution is by no means yet complete. For the first 15 years the radiologist was relying entirely on the varying atomic weights of the chemical components of the body to differentiate them on the screen; an X ray picture then showed little more than the skeleton within the soft parts. The introduction of the opaque meal about the year 1906 opened up the possibility of examining the working of all the tubular systems in the body; bismuth and barium have revealed the alimentary canal, iodine has clearly shown lesions in the genito-urinary system, the bronchi, and the spinal canal, and has made a start with the circulating blood, and what the future will bring forth only a brave prophet would say. In a paper read not long ago before the Society of Radiographers, Dr. A. E. BARCLAY remarked that the surface markings of the abdominal contents as they are now charted in students' text-books are hopelessly wrong. The living conception of the position and movements of the viscera made possible by the use of the opaque meal has shown that the shape of the viscera depends on the tonic action of the muscles which so largely compose them, that their shape varies from person to person and indeed in the same person from day to day or hour to hour. Thus the lower border of the shadow of an apparently normal stomach may be seen to drop perhaps 3 or 4 inches because of the sudden banging of a door or by the advent of nausea or giddiness. The radiologist, said Dr. BARCLAY, was inevitably struck by a lack of uniformity in the relation of the extent of the disease to the symptoms to which it gives rise. Radiology had wiped out quite a large number of text-book diseases of the stomach, each with its own set of symptoms, and only two common chronic diseases of that organ remained—namely, ulceration and cancer. For the rest, the stomach was the spokesman for the other abdominal viscera; they were apt to refer their grievances to the stomach for expression, and with the help of bismuth or barium (the Manchester Royal Infirmary alone uses about three-quarters of a ton of barium sulphate in the year) such vague complaints as nervous dyspepsia and gastritis were now referred to their place of origin in the gall-bladder, the duodenum, or elsewhere.

This *revolution in our knowledge of visceral* function has not only required steady devotion on the part of its adherents but has involved an outlay of money in apparatus such as no other branch of medicine involves. The equipment of the radiologist is expensive to start with and it rapidly depreciates in value as new methods are worked out. For this reason, although radiology in private hands holds a bright prospect (Dr. G. B. BATTEN estimates that a population of 50,000 is sufficient to maintain a whole-time radiologist), it may be desirable, as Dr. FFRANGCON ROBERTS suggested in our own columns three weeks ago, to centralise the apparatus. He has gained the impression that radiologists in this country have no desire to burden themselves with their own apparatus if they can have the use of installations at hospitals or central institutes. In Germany it seems the equipment and organisation for radiology have made enormous strides; the municipal *hospital at Frankfort-on-Maine has an institute* which has cost £2 14*s.* per cubic metre, an expense which was defrayed partly by the State and partly from the central pool of sickness insurance. Dr. ROBERTS points out quite fairly that provision for radiological diagnosis and treatment under the Insurance Acts would go far to solve the needs of radiology in this country, while the claim for State support has been strengthened by the Local Government Act of 1929 which requires voluntary hospitals to provide X ray facilities for other hospitals in the area.

The fruits of radiology will not be garnered until the practitioner realises its value to him in the daily treatment of his patients, and until the eyes of patients themselves are opened. It may not be possible for every general consultant to have an X ray installation in his consulting-room and to regard no clinical examination as complete without a view of the thoracic and abdominal organs on the fluorescent screen. As soon as he has to rely on a specialist the trouble begins; dissatisfaction with the X ray operator has been often enough expressed. One of the discussions at the recent Radiological Congress gave the radiologist the opportunity of pointing out the many types of unsatisfactory clinician met with at the present time, ranging from those who regard radiology as a joke or as an unimportant aid to diagnosis, to those who wish to interpret their own radiograms or to have them interpreted without reference to the patient's symptoms. There must be an increasingly sharp distinction, as a correspondent remarked in a letter to our columns on Nov. 30th last, between those who know what radiology will do and those who can actually take the films; but the practitioner, it seems, has little means of learning what it will do and therefore does not seek its aid. How this state of affairs is to be rectified engaged a good deal of the attention of the Congress, and the British Institute of Radiology may well have a part to play in organising post-graduate classes on the place which electrical methods and especially radiology may play in medicine. The National Insurance Fund might help by providing panel practitioners with facilities at least for learning what radiology will do, and there is a place for the endowment of chairs and lectureships in radiology. We have no reason to doubt the correctness of Dr. ROBERTS's impression that the special claims of radiology for State support have never been presented, or at all events presented adequately.

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DOCTORS AND LOCAL AUTHORITIES.

THE question how far medical practitioners are *disqualified from membership of local authorities* requires fresh consideration in view of the impending changes caused by the new Local Government Act. The Minister of Health has sent Dr. VERNON DAVIES, M.P., an important memorandum on the subject, not only explaining what he understands to be the law, but also hinting at future changes on a matter dealt with in the Final Report[1] of the Royal Commission on Local Government, which has just been issued.

The broad principle is clear. Anybody who has a contract, or is interested in a contract, with a local authority is disqualified from membership of that body. As the Minister points out, this is a general rule, applicable to employees of all kinds, solicitors, architects, and engineers, for instance, as well as doctors. One of the consequences of the new Act is to transfer numbers of officers and employees from one local authority to another. A medical practitioner may thus find himself the employee of a local authority of which he is a member; if so, he is automatically disqualified from further membership. In one respect the situation may be simplified under the new Act, for part-time medical employment will, in some degree, be giving way to whole-time employment. It needs no legal knowledge to appreciate that a whole-time servant cannot be simultaneously a master; obviously he will be debarred from membership of the body he serves. In other directions matters are not so easy. In the eye of the law the elements of a contract are present whenever a doctor does any professional work for which he receives a fee from a local authority. Parliament has recognised and remedied this difficulty in certain well-known cases where the work is of a minor or routine nature. It is specially enacted, for instance, that a doctor sending a certificate of an infectious disease (and receiving a fee therefor) shall not be disqualified from membership of the local body on that account. Similarly, there is a rule that a doctor attending a confinement on demand from a midwife, and consequently receiving a fee under the Midwives Act of 1918, is not disqualified. This ruling is not directly statutory, but is based on the technical subtlety that the doctor is not taking a fee under a contract of employment with the local authority, but that the authority is fulfilling a statutory obligation in paying him a fee for work done in special conditions contemplated by statute. Outside these specific exemptions two important classes of cases are mentioned in the Minister's memorandum. On the one hand, there are the doctors who work under a contract for occasional service—e.g., attendance at a maternity and child welfare centre, with remuneration at specified fees. The Minister states definitely that these practitioners are disqualified by the contract though it seems that the Royal Commission's Report looks for the removal of the bar. On the other hand, there is the class of cases where a local authority makes payments to a hospital with the result that a physician or surgeon working at the hospital receives some part of the payment. In these cases, says the Minister, disqualification depends upon the particular facts—in other words, the medical practitioner is left to act at his own risk, and to find out his legal liabilities in a court of law.

The situation can hardly be deemed satisfactory. The local administration of health services is not the monopoly of the medical profession. Equally it is not a form of public work to which the medical profession should be prevented from making any independent contribution whatever. Teachers, it is understood, are represented in the deliberations upon local education schemes. There seems no sense in excluding the doctor from deliberations upon health matters merely because he may find himself performing some individual service for which the local authority may pay him a fee, or because he is on the rota for duty at a maternity and child welfare centre, or is consultant to some institution rendering public assistance. The views of the Royal Commission demand serious attention. The Commissioners, it may be surmised, do not think it an advantage, either to the medical profession or to the country, that members of the profession should be barred by law from the opportunity of participating in public work as members of local bodies. Insistence upon disinterestedness is proper and in accordance with our best traditions; but where interest intervenes casually and as it were by accident, insistence need not be a fetich. A High Court judge is not thought incapable of trying an action against a railway company because he happens to be a shareholder. He mentions the fact and inquires if the parties object to his jurisdiction on that account; no objection is ever taken. If similar confidence were reposed in a medical member of a county or borough council nobody would assume that it would be misplaced. The medical member would naturally not take part in discussions or decisions affecting his own fees or professional services if any such question ever arose. In all else he should be free to coöperate with his fellow-councillors. The fact that he knows what he is talking about should not necessarily be a disqualification.

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INDIA AND THE G.M.C.

FOR some time past it has been apparent that the relations of the Indian universities with the General Medical Council were becoming increasingly strained and that recognition in the United Kingdom of their medical degrees was hanging in the balance. At the November session of the Council Sir DONALD MACALISTER made it clear that matters had reached a crisis; in his Presidential address he gave a brief summary of the course which the Council had taken since 1922 when it was first found necessary to draw attention to certain deficiencies in Indian methods of training and examination. It has never been denied that excellent work has been put into the various medical colleges in the past, and originally, in many respects, their facilities compared favourably with those of similar institutions elsewhere. This was made evident by the high honours which some of their students obtained periodically in British examinations. But, as at home, conditions changed for the worse during and after the war, owing to the overcrowding which was inevitable at that time, and it was a matter of common knowledge that schools with twice the normal number of students were working with facilities which had been little if at all expanded since the war. The deficiency which first attracted attention was in midwifery, a subject in which it has always been difficult to arrange for practical instruction in India, but it has since been shown that clinical material for other subjects was inadequate during this period.

When these deficiencies came to their notice the General Medical Council very reasonably drew attention to them, pointing out that in its capacity of guardian for the British public it could not overlook obvious shortcomings of this character, if Indian graduates were to be allowed to practise in the United Kingdom. The line taken by the Council, as Sir DONALD has stated, was that India should herself give some guarantee of uniformity of standards, the best means to this end being the creation of an All-India Medical Council, which would be responsible for the regulation of medical education and registration in India, in much the same way as the General Medical Council is responsible at home. Provincial medical councils already exist, and these would presumably continue in some form, but it was evidently thought that under present conditions they could not provide adequate assurance of the maintenance of uniform standards. The Council recognised, however, that the establishment of a central body would take time, and in order to allow for a period of reconstruction it asked that an inspecting officer should be appointed, to keep the Council informed of the condition of the various schools and the standard of examinations. The proposal was accepted, and an inspector, appointed by the Government of India, for some time kept the Council in touch with the schools. Incidentally, with a certain amount of discussion—and sometimes it must be confessed with some friction—various improvements designed to bring the Indian schools more or less into line with the revised British curriculum were introduced, and with one or two exceptions recognition of the Indian degrees for practice in the United Kingdom was maintained, and extended from year to year, pending a more permanent solution of the difficulties by the constitution of an All-India Council. The negotiations can be followed in detail in the minutes of the G.M.C.; suffice it here to set out the way in which they finally broke down. Regular inspections by a single approved official having lapsed, the Council has asked to have them reintroduced, and has further pressed for the setting up of an All-India Council. Both provincial and central governments, recognising the gravity of the situation, agreed to the reappointment of an inspector, and the same officer who had carried out the duties previously, and whose experience made him the one man suitable, was kept in readiness for the post. Arrangements for introducing an All-India Medical Council Bill, which had been for some time under consideration, were completed, and a draft was brought to the notice of the authorities concerned. What is the result? The proposal for the appointment of a Government commissioner of medical qualifications and standards evoked strong criticism from the nationalist members in the Legislative Assembly, and it was found necessary to postpone its consideration to a later session. The preliminary negotiations for the formation of an All-India Council got no further. The captious nature of some of the arguments against the appointment of an inspector may be judged from the fact that one speaker objected on the score that the officer proposed belonged to the Indian Medical Service, while another—one of the most prominent Hindu leaders—spoke of the disrespect which such a proposal involved to the Indian universities. He would rather, he said, close the universities than have them submit to such an indignity, and he would welcome the day when British registration of Indian degrees was considered of no value. There was also a good deal of wild talk of medical dictators and the tyranny of the British—i.e., the General Medical Council.

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[1] H.M. Stationery Office, Cmd. 3436, 1929, pp. 169, 3s., see p. 157.

The issues at stake are undoubtedly grave, involving, if only Indian educational and political leaders would realise it, not merely the recognition of Indian degrees in Great Britain, but their standing everywhere outside India also. The G.M.C. has exercised patience to the utmost limits; in spite of frequent misrepresentations it has been the best of friends to the provincial councils in India, which were founded largely on its example and advice. Time and again Sir DONALD MACALISTER has made it clear that the Council is not concerned with the standard deemed sufficient for practice in India, but only with that which it is required by law to enforce for medical practice at home, and it is easy to imagine that nothing would please the Council better than to divest itself of all responsibility for Indian affairs. The matter, however, is of such deep concern to India that we trust the Council will continue to exercise the patience and forbearance it has shown so abundantly in the past. The more sober sections of Indian opinion will no doubt realise the importance of a link which the extremists are so eager to cut. They will see that recognition once lost may be very difficult to regain, and we may hope that even at the eleventh hour some acceptable plan may be arrived at. The creation of an All-India Medical Council cannot injure national susceptibilities, it will increase national prestige; while the appointment of an inspecting officer is a temporary expedient to fill in the interval before it is appointed. But the time for action on either side is short if, as now appears, recognition is not to be extended beyond February in the absence of the required reports. It would indeed be lamentable if all the efforts of administrative officers, and other people of goodwill both in England and India, were to be rendered null and void by a few words spoken in the heated atmosphere of the Legislative Assembly.

Annotations.

"Ne quid nimis."

NEW YEAR HONOURS.

THE following is the list of New Year Honours as far as they directly relate to the medical profession. It was issued on the last evening of the old year. No medical names are to be found among the new peers or baronets.

G.C.B.

Surgeon Rear-Admiral Robert William Basil Hall.

C.B. (Military Division).

Major-General David Harvey, C.M.G., M.D., K.H.S. (late Royal Army Medical Corps), Director of Pathology, the War Office.

Colonel Arthur Brownfield Fry, C.I.E., D.S.O., M.D., Indian Medical Service, Assistant Director of Medical Services, Presidency and Assam District, India.

K.C.M.G.

Sir James Crawford Maxwell, M.D., K.B.E., Governor and Commander-in-Chief of Northern Rhodesia.

Lieut.-Colonel Andrew Balfour, LL.D., M.D., C.B., C.M.G., Member of the Colonial Advisory Medical and Sanitary Committee, Director of the London School of Hygiene and Tropical Medicine.

C.I.E.

Lieut.-Colonel Walter Valentine Coppinger, D.S.O., M.D., F.R.C.S.I., I.M.S., Inspector-General of Civil Hospitals, Central Provinces.

Lieut.-Colonel Arthur Francis Hamilton, M.B., F.R.C.S., I.M.S., Professor of Midwifery, Grant Medical College, Bombay.

K.C.V.O.

Russell Facey Wilkinson.

C.V.O.

Sir George Washington Badgerow, C.M.G., M.D., F.R.C.S.

Herbert Stanley French, C.B.E., M.D.

G.B.E. (Military Division).

Surgeon Commander William Innes Gerrard, M.B., D.P.H. M.R.C.P., R.N.

K.B.E. (Civil Division).

The Honourable Stanley Seymour Argyle, M.B., lately Chief Secretary and Minister of Public Health, State of Victoria.

O.B.E. (Civil Division).

William Alfred Stedwell Lamborn, M.R.C.S., L.R.C.P., Medical Entomologist, Nyasaland Protectorate.

Harold Armstrong Crouch, M.C., Medical Inspector, Upper Nile Province, Sudan.

Charles Johnston Smith, M.B., Senior Surgeon, Singapore.

M.B.E. (Civil Division).

John Young McFadyen, M.D., Magistrate and Medical Officer, Anguilla Island, Presidency of Saint Christopher and Nevis.

Knight Bachelor.

Prof. Temistocle Zammit, C.M.G., M.D., D.Litt., Curator of the Museum, Malta.

Kaiser-i-Hind Medal.

Miss Mary Longmire, M.B.

The following names will be recognised with pleasure in the list, as their owners in different capacities have worked in relation to medicine in one aspect or another.

Sir Gregory Foster, late Provost of University College, London, has been created a baronet. Mr. L. L. Cohen, hon. sec. to King Edward's Hospital Fund for London, receives the *K.C.V.O.* Miss Gertrude Tuckwell, a member of the Women's Central Committee on Women's Training and Employment, receives the C.H. Major-General William Samuel Anthony, C.M.G., Director-General, Army Veterinary Services, is created C.B. Prof. J. S. S. Brain, professor of chemistry at the R.N. College, Greenwich, receives the C.B.E., and Mr. E. S. Russell, D.Sc., of the Ministry of Agriculture and Fisheries, receives the O.B.E. The M.B.E. has been conferred upon Miss Elsie Hughes, secretary to Lord Dawson of Penn, for services rendered during His Majesty's recent illness, and the same distinction has been conferred upon Mr. D. H. J. Nicholas, in charge of the Government House Dispensary, Madras.

The O.B.E. (Civil Division) has been conferred upon, Miss Helen Grace Palin, principal matron, Ministry of Pensions Nursing Service, and Miss Lily Richards, matron, Royal Westminster Ophthalmic Hospital, while Miss Ethel Harrison, superintendent of the Northrup McMillan Nurses' Institute, Kenya Colony receives the M.B.E.

The following names among the nursing profession are included :—

Royal Red Cross 1st Class.—Superintending Sister Nita Courtice.

Superintending Sister Marguerite M. Abraham.

Royal Red Cross 2nd Class.— Nursing Sister Leonora C. Hooper.

Nursing Sister Alice M. Shrewsbury.

THE CHANGES IN THE HOSPITAL SYSTEM.

JANUARY will be an important month in relation to the arrangements, often difficult and complicated, for the taking over, under the new Local Government Act, by county councils and the town councils of county boroughs, of institutions hitherto belonging to poor-law authorities. In self-contained areas the operation will be simple enough ; the complications come in when the areas of these institutions are not wholly comprised within one county or county borough. When this happens the councils affected, which may be more than two, will have to come to an agreement. A fair number of such agreements have been reached, but many are still outstanding, and the sands are running out. If these adjustments are not made by the end of the present month they will be made by the Minister of Health, whose Order might conceivably take a form not altogether pleasing to one or other of the authorities concerned. The Ministry of Health has laid stress upon the obvious desirability and convenience of the ownership of transferred institutions being vested in one council, and it is here that friction seems most likely to arise. Happily, goodwill appears to be in the ascendant, and we may therefore hope that troublesome details will get themselves settled without an aftermath of local jealousy.

Good progress appears to have been made in the constitution of the Public Assistance Committee upon which so much hard work will fall. In a number of instances, however, councils have taken the view, which they are perfectly entitled to take, and act upon, that only elected representatives of the ratepayers ought to serve on these bodies. Nevertheless this view will probably be found, by experience, to be short-sighted. By no means every elected councillor has been a guardian, and intimate knowledge of poor-law work on the part of those who will in future have to administer it is surely essential. Education committees are almost invariably "stiffened" by the coöperation of experts, and the power to coöpt is one of the most useful of the liberties accorded by the Act. Some complaints are also made of the insufficient representation of women on the committees. Women long ago became expert guardians, and there would seem to be wide scope for their help, also on the hospital side of public assistance. Upon certain subcommittees they are bound to be placed, but it is desirable that they should have a voice in that shaping of general policy which will be the work of the main body. It is hardly to be expected that a great new system, some of the implications of which are as yet obscure, should "shake down" at once. Experience, especially in the vitally important matter of coöperation between the public assistance hospitals and the voluntary hospitals, will be gained gradually, but meanwhile, so far as a general survey of the field is possible at this juncture, there appears to be an entire absence on the part of the county and town councils of any desire to interfere with the control of the voluntary hospitals.

The latter are, indeed, in so strong a position that there seems to be little ground for the fears that have sometimes been expressed, that they might be swallowed up. The simple fact that they are entitled to be consulted upon developments proposed by the councils, but are not called upon to consult the councils upon their own development, should be an almost complete safeguard. It is to be hoped, however, that there will be no mere standing upon dignity, no insistence upon the letter of the law in this highly important matter. The whole future of the new hospital system will depend upon constant good understanding and systematic well lubricated coöperation between the voluntary hospitals and those administered by public authorities. Not otherwise will it be possible to derive the fullest advantage from a change which aims at coördination and interchange, although not at technical fusion. Any general lack of understanding would have deplorable results, not the least deplorable of which would inevitably be a large degree of that bureaucratic interference which would be the worst of menaces to the voluntary system.

POSTURE IN HEALTH AND DISEASE.

SOME of the principles which govern the actions of the joints and muscular systems of the body were expounded by Miss M. Forrester-Brown in an address delivered to the London Association of the Medical Women's Federation on Dec. 16th. She held that these were not well understood either by general practitioners or by medical gymnasts. It was not generally realised that the normal spinal column is not equally mobile in all its joints. X rays show that extensor movements occur chiefly in the lumbar and cervical regions, and that there is a fixed kyphos in the thoracic region with its maximum at the seventh vertebra. Back-bending exercises, she said, increase rather than reduce this kyphos, and only under pathological conditions or in acrobats can it be reduced to lordosis. Other useful observations made by the lecturer are the following: The number and shape of the vertebræ exhibit considerable variation within normal limits. In the lumbar region four vertebræ may be present in an individual of stocky build, and five deep vertebræ are commonly found in slender, long-backed subjects, who tend to become visceroptotic and are always unsuited to heavy physical work. Ill-health may often be prevented by the choice of work to which the individual's physical type is best adapted. Muscles are more important than ligaments in affording support to joints. The tone of muscles depends on an intact reflex arc, and is diminished by fatigue in the central nervous system, and not by fatigue in individual or groups of muscles.

The effects of emotion on posture are illustrated by the typical attitudes assigned to fear, deceit, courage, and triumph, and, according to Miss Forrester-Brown, the effects on a child's temperament of treating faults in posture are often striking. The slouching child is often a sulky child. When judicious use of a long mirror makes the child realise the unsightliness of her posture, he or she can often be stimulated to take an interest in the treatment; it is when the patient coöperates with enthusiasm that the best results can be obtained. The attitude of the spine depends on the tone of the vertebral and abdominal muscles and on the tilt of the pelvis. The position of the head is relatively unimportant in connexion with good posture, for the reflex motor system is at peace provided the eyes are horizontal. That this effect can easily be achieved with a faultily held spine is evident in many tuberculous lesions of the spine where gross deformities are present. Good posture depends chiefly on good balance, and in maintaining this the spinal and abdominal muscles are of equal importance; factors such as warm air, tonsillar infection, and chronic constipation, which lower their tone, are responsible for bad posture in many children. The child living in a civilised community certainly suffers in several ways by being deprived of the stimulus of cold air and sunshine on the body, and the provision of these stimuli is an important factor in treatment.

The treatment of faulty postures, said Miss Forrester-Brown, are rest, fresh air, massage, and exercises, with correct breathing as an important adjunct. Mobility rather than depth of chest should be aimed at; the well-developed puffed out chest is not the ideal inspiratory position. When inspiration is carried out with both arms raised the muscles attaching the arms to the chest wall are shortened, the play of the ribs inhibited, and movements of the diaphragm diminished. Since diaphragmatic respiration represents a larger volume of air than thoracic respiration, so-called "abdominal breathing" should be taught to children in the recumbent position, and the shoulder-shrugging and leg-bending exercises should also be done in this attitude. The value of recumbency to the growing child is not nowadays generally appreciated. The Victorian principle of resting on a backboard was, in Miss Forrester-Brown's view, a sound one, and the teaching of deportment should be advocated. The country dancing now popular makes for a sense of rhythm, but does not inculcate balance, control of movements, and grace, as did training in the old court dances. Faulty sitting postures are common in school-children, and result in crowding of the ribs and sagging of the abdomen. Sitting in a straight-backed chair causes less fatigue if a small pillow is placed in the small of the back to support the natural lumbar lordosis. Such a pillow should be used also during operations in the Trendelenburg position. Its support of the sacro-iliac joint should prevent the post-operative pain in the leg which is caused by pressure on the nerves as they pass through the foramina.

CAUSES OF BALDNESS.

THE problem of common baldness is still more or less unsolved, and in its treatment we have made scarcely any progress of importance since Unna attributed the condition to infection by the organisms of seborrhœa. This explanation is evidently not the whole story; protracted and conscientious application of sulphur, which remains our most potent remedy for seborrhœa, is rarely successful in promoting a cure, although it is of undoubted value if begun early in life when excess of scurf is first noticed. In a recent post-graduate lecture[1] in Vienna, R. O. Stein pointed out that seborrhœa is common in African natives, and yet the bald man is seldom seen among them. Clearly there are other factors at work besides infection, and no one can fail to be struck by the close association of the state of the hair and the state of endocrine metabolism. In his first Lettsomian lecture last year Dr. H. W. Barber[2] said that "virility tends to loss of hair on the scalp with its increased luxuriance on the beard and body; feminism to a converse distribution." Sabouraud states that eunuchs are seldom if ever affected by the male type of baldness, and women, of course, show a similar immunity, which can be disturbed by endocrine disease. Dr. Barber mentioned a case in which a woman with a suprarenal tumour grew a beard and moustache, and went bald like a man. When the tumour was removed the hair on the face fell off, and the scalp regained its covering, but the signs of virility again returned with recurrence of the tumour. It is, perhaps, something of an anti-climax to recall that popular belief attributes baldness to the wearing of a tight hat—a view which is shared to some extent by dermatologists. W. A. Pusey[3] has lately remarked that "in the common occurrence of baldness we have a manifestation of a transitional stage in man's evolution..... Man now uses a hat instead of relying upon a shock of hair as his ancestors did..... This does not mean that we can save our hair by discarding our hats. We are a result of our ancestors, and to save our hair we should have to discard the hats of all our ancestors for scores of generations back." There is a certain amount to be said for this "vestigial" ætiology of baldness, but it has to reckon with a persistence of the axillary and pubic hair, which has survived in spite of all our clothing. Every theory yet devised has its weak spots, and at present it looks as though alopecia presenilis would long continue to embarrass the profession and enrich the advertising quack.

RUMINATION IN MAN.

Three hundred years ago Jerome Fabricius of Aquapendenta recorded the case of a young man who began to ruminate through worry because his father's forehead had suddenly sprouted horns—a state of affairs calculated to disturb even the least filial. Dr. Charles-Franceis Long, who quoted this story before the College of Physicians of Philadelphia, has collected[4] six cases exhibiting the phenomenon of rumination, and has investigated some of them radiographically, with a view to determining the mechanism of the act. Three out of the six subjects were Russian Jews, and all were of the fidgetty and neurasthenic type. Only one appears to have appreciated the commercial value of his condition, and he was an Egyptian who publicly performed prodigies of swallowing and regurgitation, finishing regularly with half a pint of kerosine, which was expelled in jets over a lighted candle, and produced a series of spurts of flame. Most ruminants, Dr. Long discovered, were hasty and large eaters, and were at great pains to conceal their ruminating faculty from their friends and relations. The food usually returned to the mouth without effort, 15 to 30 minutes after the meal, in the state in which it was swallowed, and could be re-masticated; the process stopped automatically as soon as the food began to taste sour. Most of the patients derived considerable pleasure from the second mastication, one of them insisting that it doubled the enjoyment of a good dessert. In most cases there was no selective power over the type of food returned, though the Egyptian actor claimed to have this faculty. The hereditary aspect has been stressed by other writers, but Dr. Long found evidence of this only in the family history of the actor. Rumination in the cow, as investigated by Toussaint 50 years ago, is, he says, associated with reduction in the intrathoracic pressure, and aspiration of the food out of the passive rumen. In the two cases which Dr. Long examined radiographically no evidence was found of an analogous mechanism in human ruminants, except that, as with herbivora, the act was preceded immediately by one of swallowing, which induced relaxation of the cardia. In the first case examined radiographically the stomach showed a functional hour-glass constriction, and when rumination occurred the food was squeezed out of the upper pole by a general contraction of the muscle wall. In the second case, which was that of the actor, the stomach was enormously distended, and some of the barium passed through into the small intestine. The stomach was apparently emptied both by contraction of the abdominal muscles and by generalised contraction of the whole stomach wall. The lower end of the œsophagus during the act showed a series of rhythmic contractions and relaxations; no peristalsis or reverse peristalsis was observed in the intestine. That this man was not a case of voluntary vomiting was shown by the history, which was that of a ruminant who had developed his peculiar faculty to the utmost, and by his capacity for controlling the amount of food returned.

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[1] Wien. klin. Woch., Nov. 21st, 1929, p. 1510.
[2] THE LANCET, 1929, ii., 369.
[3] Care of the Skin and Hair. New York, 1929, p. 164.
[4] Amer. Jour. Med. Sci., December, 1929, p. 811.

GRATUITOUS SPLINTS AND SURGICAL APPLIANCES.

THREE months ago we brought the fact to the notice of many whom it interested actively that the Government contractors, Messrs. A. Fleming and Co. (39, Victoria-street, London, S.W.) had on their hands a stock of splints and kindred appliances taken over from the R.A.M.C. stores at the termination of the war. The contractors informed us then of their intention to give away free of charge to hospitals, infirmaries, and similar institutions large quantities of this stock which was all new and, though sometimes store-soiled, in thoroughly serviceable condition. The contractors are repeating this offer, as, although over 2000 splints of various types and patterns have been distributed and applications have been received from places as far away as China, the supply available is not exhausted. We learn from them, however, that inquiries are still being received for the appliances, and for particulars of the generous scheme of Mr. Alfred Fleming—for it is he who has been personally responsible for distributing the material which was purchased by him from the Government. The following apparatus is held at the disposal of suitable applicants:—

Leg and thigh splints, wood, Liston's pattern, in sets of three, with and without footpieces.
Extension apparatus, Guy's pattern, complete with clamp, shot can, pulley and cord.
Arm extension splints, with leather padded swivel ring.
Sinclair's modification of Thomas's knee splint.
Back, leg, and thigh splints, Nevill's pattern, white enamelled iron. No pads or straps available.
Footpieces, wire, for use with Thomas's leg splints.
Footpiece supports, iron, for use with Thomas's leg splints.
Leg splints, Thomas's, large with leather padded fixed ring.
Pattens's japanned iron, for use with Thomas's leg splints.

The scope of the donations, which were originally confined to hospitals (including homes for cripples) and infirmaries, is now enlarged and the offer is extended to establishments where training is given in first aid, and we are authorised to say that a large number of splints and other appliances can be disposed of in this generous way free of charge provided the recipients pay the carriage from the depot at Portsmouth to their own door. To institutions which have not taken advantage of this offer we bring it to their notice, for the need for surgical appliances must surely have increased with the increasing number of road accidents through motor traffic. To many institutions whose geography has exposed them to the expense of dealing with these accidents the chance for replenishing a heavy drain on their stocks will be welcome.

SPEECH AND INTELLIGENCE IN CHILDHOOD.

WHERE there is any question of retarded development it is important to find out just when the various bodily functions have been acquired; for these milestones of infancy and childhood often afford the only reliable evidence bearing on the onset of defects. Certain of them, such as the times of sitting, standing, walking, and talking are so constant as to furnish useful information. Others, such as the acquisition of sphincter control, are much more variable, and it is usually thought inadvisable to attach diagnostic importance to them. Of all the milestones which are of practical value, the beginning of speech is perhaps the most important, but it is also the least easy to recognise, because of the long time between early essays and finished perfection in this art. Taking the onset of speech to mean the age at which the child "utters a sound with full consciousness of its meaning and for the purpose of communication," Prof. Abt and co-workers[1] have made an extensive investigation into the records of 1000 cases examined at the Institute for Juvenile Research at Chicago, where the age of onset of talking, walking, and bladder control, the mental age and intelligence quotient (I.Q.), and other data have been recorded. The investigation was intended to apply to children whose faculties were within normal limits, and cases with gross mental defect, deafness, or anatomical abnormalities were discarded, as also were those concerning whom the replies were unduly vague. Analysis of these records showed a very close correspondence between the age of onset of speech and the I.Q. at the time the child was seen; but there was great variation in the ages at which the children were examined. The chart in which this correspondence is graphically displayed suggests that the higher the (subsequent) I.Q. the earlier the child learnt to talk. Very similar results were obtained by comparison of the general intelligence with the age of onset of walking. It has been stated that the ordinal position of the child in the family has an influence on the age of onset of speech—the younger ones reaping an advantage from their opportunities of imitation; but Abt and his colleagues failed to find any evidence of this influence. From the records of a small group of cases it appeared that prematurity was also without influence on speech. It was found, however, that the average age of learning to speak was considerably lower (17 months) in the group of children who had acquired sphincter control at 3 than the corresponding age (21 months) in the group which had not. The conclusions drawn from this interesting study are mainly consonant with the views most commonly accepted in this country, except that so close a correspondence between the onset of speech and of bladder control has not perhaps been recognised here. When applying the conclusions to clinical problems it should be borne in mind that the writers of this paper were investigating the *average* and not the *normal*. A point which remains unsettled, and on which opinion differs a good deal, is the extent of variation which constitutes pathological retardation sufficient to have a prognostic significance. All cases with physical defects were wisely excluded from the American series. The difficulties presented by deafness are well known, but one of the commonest causes of error in diagnosis and prognosis is the application of speech development as a test of intelligence in children who have suffered cerebral damage.

SLEEP AND INTRACRANIAL PRESSURE.

SOME investigations of the relationship between sleep and intracranial pressure have recently been reported by Stevenson, Christensen, and Wortis,[2] who have studied variations in the intracranial pressure in five patients who had a cranial defect resulting from operation. They employed an apparatus consisting of a closed air tambour system under a positive pressure of about 12 mm. of mercury. One tambour was strapped and bandaged over the brain hernia, and the other was attached to a light-weight pointer which registered on a smoked drum changes of intracranial pressure produced by the pulse, respiration, sleep, and the administration of certain drugs. A number of observations were made upon patients during the period of falling asleep and of awakening. The tracings constantly showed a rise of pressure associated with falling asleep and a fall of pressure corresponding to awakening. The effect of administering certain drugs was very interesting. Morphia was found to cause a rise in intracranial pressure and caffeine a fall. The authors are influenced by their observations to lay stress upon changes in intracranial pressure as playing an important part in the causation of sleep and of awakening. They attribute sleep to a periodical fatigue of "sympathetic centre in the brain which maintains vasomotor tone in the vessels." This is assumed to produce a vasodilatation of the blood-vessels of the brain as a result of which the brain volume becomes increased "with a consequent falling apart of the neurons." The pressure of the cerebrospinal fluid within the brain is also increased and this may alter the conductivity of the synapse. This mechanical view of the nature of sleep can hardly be reconciled with the conception of sleep as inhibition which Pavlov has proposed. Stevenson and his colleagues assume that the changes in intracranial pressure which accompany sleep and awakening are themselves causative factors of these changes of state. It may, however, be assumed with equal justification that the changes in intracranial pressure are secondary to the onset of sleep and its cessation. The latter view is supported by the fact that although pathological states of increased intracranial pressure are sometimes associated with drowsiness this is by no means always the case. Further, even if we accept the existence of the hypothetical sympathetic centre controlling the tone of the cerebral blood-vessels we have still to explain its periodical fatigue. It is doubtful, then, whether the purely mechanical view of the nature of sleep can be accepted. Nevertheless, the experiments reported are of considerable interest to those who are concerned with pathological variations in the intracranial pressure. The observation that caffeine lowers the intracranial pressure may have practical value in treatment and may explain the benefit derived from its use in such conditions as migraine. Diuretin has already been used by Marriott in the treatment of hydrocephalus in children.

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[1] Abt, I. A., Adler, H. M., and Bartelme, P.: Jour. Amer. Med. Assoc., 1929, xciii., 1351.

[2] Stevenson, L., Christensen, B. E., and Wortis, S. B.; Amer. Jour. Med. Sci., November, 1929, p. 663.

RECTAL EXAMINATION IN LABOUR.

ALTHOUGH used as a routine in certain foreign clinics for upwards of a quarter of a century, rectal examination in labour has never been widely adopted in this country. The reason probably is that few British obstetricians have been convinced that the greater safety from puerperal sepsis compensates for its obvious disadvantages. The subject has lately been considered anew by La Vake,[1] and the advantages he claims for rectal examination, which he has used regularly since 1913, are briefly as follows: (1) There is no risk of introducing bacteria into the vagina. (2) Repeated examinations can be made in all types of surroundings without increase in danger. (3) The time of the attendant is saved because no elaborate preparations are required before examination. (4) In over 95 per cent. of cases that will end spontaneously, the rectal and abdominal examinations give all the data needed for diagnosis. (5) After rectal examination any operative interference can be undertaken with the assurance that pathogenic organisms have not been introduced into the vagina. (6) Absence of vaginal examination increases the confidence of the patient and the medical attendant. With regard to technique, La Vake points out that care should be taken to avoid soiling the external genitalia and that the thumb must be kept away from the vulva. He admits that investigation per rectum is more difficult for the student to master than investigation per vaginam, but he thinks this is more than offset by the much greater frequency with which it can be done. The best way to start the teaching of rectal examination is to begin in the gynæcological and out-patient department "where on all gynæcological, and on all pregnant patients in the early months, the recto-vaginal examination may be made and the student can check up his rectal findings by his findings with the vaginal finger. . . . Rectal examinations alone of patients in the last six weeks of pregnancy, especially in multiparæ, are most instructive, because in many of these cases the presenting part is easily felt and obliteration of the cervical canal and even dilatation has in many instances gone far enough to be distinctly manifest."

It would have been of great interest had La Vake given details of the incidence of sepsis in his clinic during the 16 years that rectal examination has been practised. He is content, however, with the general statement "each year's experience in all types of situations and conditions has added to my conviction that the rectal examination is potentially the safer examination, and the vaginal examination under the most meticulous aseptic technique should be used only when the rectal findings leave one in doubt. It is my belief that the universal teaching and use of the rectal examination. . . would reduce the incidence of postpartum sepsis." The figures he quotes from other clinics tend to support, but certainly do not prove, this contention. Guggisberg, at Berne, employed vaginal examination from 1901 to 1911 in 4642 cases; in 17·5 per cent. the temperature reached 37·5° C. (99·5° F.), genital infection occurred in 11·2 per cent., and death from sepsis in 0·12 per cent. From 1912 to 1921 3010 cases underwent rectal examination only; the temperature reached 37·5° C. in 11 per cent., genital infection occurred in 5·5 per cent., and there were no deaths from sepsis. The balance here was decidedly in favour of rectal examination. In a similar study by Reis, the number of cases was smaller, but they were all seen in one year (1924), and the conditions in the two sets of cases were more likely to be comparable; 609 cases were examined by the vagina, 271 by the rectum, and 106 not at all. The pelvis was infected in 6·3 per cent. of those rectally examined, in 5·9 per cent. of those examined vaginally, and in 4·7 per cent. of those who had no examination. Reis also tabulated his cases according as they were febrile or afebrile; any patient showing more than half a degree rise of temperature at any time during the first seven days after delivery was considered for the purpose of this investigation as being febrile. Comparing the cases delivered spontaneously, it was found that of those who had rectal examination 54 per cent. were afebrile; of those examined vaginally, 57 per cent. were afebrile, while of those who were not examined either vaginally or rectally, 64 per cent. were afebrile. Reis therefore concluded that the percentage of absolutely afebrile cases is definitely increased when neither rectal nor vaginal examination is made, and conversely that the percentage of pelvic infection is definitely decreased, but that there appears to be "practically no difference between the group examined vaginally and the group examined rectally."

On the whole no strong case seems to have been yet made out on behalf of rectal examination. Possibly the question can never be decided until we have a final pronouncement on the pathogenicity of the flora of the normal vaginal canal. If the organisms normally present are either actually or potentially pathogenic, then rectal examination might be as effective as vaginal examination in introducing them into the interior of the uterus.

CHILD WELFARE IN AUSTRIA.

THE Commonwealth Fund is now actively promoting schemes for child welfare in Europe as well as in America, and the directors of that branch of the Fund which serves Austria have issued a report[1] of their efforts over a period of six years. They have followed the excellent American practice of subscribing generously to any venture which they have helped to set on foot, while not subsidising it entirely. This guards against the collapse of a project when funds are withdrawn, and has the added advantage of stimulating local effort. The difficulties of coördinating health organisation in post-war Austria are well described; the independence of the nine provinces, with feudal traditions suddenly overthrown but still in the minds of the people, and the shattered economic situation, make this no easy field for health work. The character of the Austrians, however, lends them stability in their disorganised environment. They are receptive, and readily inclined to take an intelligent interest in fresh views, while the autocratic Government to which they were formerly accustomed has made them amenable to direction and guidance; for example, the patients attend unquestioningly at the clinics on the date fixed by the doctor. But the intensely local patriotism of each province makes any central organisation impracticable at the present time. Medical assistance for the sick child after the war was obtainable in Austria by means of several different agencies. One way was through the health insurance societies, or Krankenkassen, which provided treatment for the families of their members; another was through private child health stations instituted and run by doctors; a third was through the city health stations, or Jugendämter, with which there came to be associated after the war a group of trained workers called the Fürsorgerinnen. The functions of these home workers cannot be exactly matched elsewhere; they combine advice on child welfare to the mothers with a knowledge of standardised procedure in social problems; that is to say, they arrange for State care of illegitimate and orphan children where necessary, and for reception into institutions of tuberculous or mentally defective cases. Their influence among the peasantry is large, and has been of great assistance in solidifying the new health schemes which the Commonwealth Fund has helped to set on foot. For every province the reorganisation of child health work had to be approached in a different manner. The report gives a detailed account of the various methods employed and the results obtained. The aim has been throughout to exert a unifying influence, and the Fund has done much to coördinate the work of the health centres in each province, to promote a friendly spirit between the staffs of the different clinics, and to provide facilities for foreign travel and instructional courses for the workers. This has had an encouraging effect on the general efficiency of the service, and has greatly stimulated the interest of those engaged in it. Gifts of equipment have been made by the Fund, and assistance given in improving old quarters or obtaining new ones. This coöperation has helped considerably to relieve the post-war depression in the Austrian medical service.

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[1] La Vake, R. R.: Amer. Jour. Surgery, November, 1929, p. 683.

[1] The Commonwealth Fund Activities in Austria: A Record of Collaboration for Child Health, 1923–29. New York: The Commonwealth Fund Division of Publications. George Grady Press.

INFECTION AS A CAUSE OF DIABETES MELLITUS.

THE ætiology of diabetes mellitus remains a problem of great complexity. The classical experiments of Minkowski and von Mering[1] on the effects of pancreatectomy and the isolation of insulin indicate that the essential defect is an inadequate supply of the pancreatic hormone. Many factors, however, are known to be capable of thus adversely affecting the secretion of insulin, and diabetes must be regarded, not as a morbid entity, but as the end-result of a variety of pathological processes. In a minority of cases the chain of events is relatively simple. In the diabetes which sometimes complicates hyperthyroidism, for example, it is probable that over-activity of the thyroid leads to over-stimulation, followed by exhaustion, of the β cells of the islets of Langerhans. In the great majority of cases of diabetes, however, the damaging agent is not obvious. At a recent meeting of the Pathological Society of Manchester Dr. T. H. Oliver and Dr. G. J. Langley discussed the possibility that diabetes is sometimes infectious in origin. There is much circumstantial evidence in favour of this view. Various bacterial and allied poisons, such as diphtheria toxin (Tisdall, Drake, and Brown[2]), typhoid vaccine, and histamine are known to lower carbohydrate tolerance in animals, and in human diabetes coincident infection very frequently causes a temporary or even a permanent decrease in the response to insulin, and often precipitates coma. Dental sepsis is almost universal in diabetic patients, but, while it is attractive to attribute diabetes to continued absorption of bacterial toxins from the teeth sockets, it must not be forgotten that the dental infection may be the result of that lowered resistance to bacterial invasion which is common to all diabetics. In young subjects diabetes occasionally follows an acute infectious disease such as mumps, and in many cases of acute diabetes the onset of the symptoms can be traced to an indefinite febrile illness. These considerations have led many observers (cf. Frissell and Hajek[3]) to suggest an infectious origin in such cases. Bergey's claim[4] to have isolated from diabetic urine a filter-passing virus capable of producing glycosuria in rabbits does not appear to have been substantiated, but a virus infection, analogous to mumps, may well be concerned. If this is so, since diabetes is not contagious, the virus must be widespread and, like the virus of febrile herpes, must remain latent until activated by some other infection.

Infection undoubtedly plays some part in the production of diabetes; how large a part this is remains uncertain.

A RELIABLE TEST FOR PREGNANCY.

LAST week, in recording inconclusive though encouraging results of attempts to get clinical improvement by injections of œstrin, we had occasion to regret that the sexual cycle in man has no exact parallel in the animal world. In this issue of THE LANCET Dr. H. Allan and Dr. F. Dickens show that man's peculiarities in this respect can sometimes be exploited to good advantage. If the pregnancy test devised by Zondek and Aschheim had been tried out on domestic animals, such as cows, where early knowledge of impregnation would be of great value to dairy farmers, it might easily have been dismissed as worthless; in the few pregnant animals tested—cows, cats, and rabbits—the results obtained were negative. Fortunately the urine of pregnant women appears to contain a hormone which, when injected into immature mice, produces changes in the ovary that can mostly be recognised macroscopically. This hormone is not œstrin, which is also present in the urine and, as our Berlin correspondent reports, may be obtained from this source in an extraordinary state of purity. Œstrin, however, produces no such change in the ovaries, though it has an effect on the development of the immature uterus and vagina. Zondek and Aschheim believe the active hormone to be anterior pituitary.

From the clinical point of view the important fact is that critical observers such as those working at the Courtauld Institute of Biochemistry of the Middlesex Hospital, under Prof. E. C. Dodds, have found that among 126 women known to be pregnant 122 gave a positive test, while only 1 out of 82 non-pregnant women did so. Moreover, the patients selected were at an early stage of pregnancy when clinical diagnosis is still difficult. The test seems to be sufficiently reliable for all clinical purposes, and has the further advantage that in delicate circumstances it can be done without the knowledge of the patient or her friends. The technique needs practice, but is likely to be acquired by clinical pathologists now that the value of the test has been confirmed. The family doctor will be grateful for the simplicity of his share, which consists only in collecting morning urine from the patient and possibly adding a drop of tricresol as a preservative.

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[1] Minkowski and von Mering: Arch. f. Exp. Path. u. Pharm., 1889–90, xxvi., 371.

[2] Tisdall, F. F., Drake, T. G. H., and Brown, A.: Amer. Jour Dis. Children, 1926, xxxii., 854.

[3] Frissell, L. F., and Hajek, J.: Arch. Int. Med., 1924, xxxiii., 230.

[4] Bergey, D. H.: Proc. Soc. of Exper. Biol. and Med., 1926, xxiv., 229.

A SERVICEABLE LIBEL.

A WEEK or two ago our Paris correspondent told how a physician of good repute had exposed a "specific" against tuberculosis composed of cigarette paper soaked and crumbled, and had called the inventor of this priceless remedy a thief and a quack. For this language Dr. Nast was sued for libel, although it was anticipated that, even if he was convicted, the court would let him off lightly. This has proved to be the case, for the sentence passed on Dr. Nast carries the minimal penalty allowed by law—namely, 1 franc of damages to the inventor of the "specific" and a fine of 25 francs, which need only be paid if the malefactor is again convicted within the next five years. It is customary in France for one who is convicted of libel to be ordered to insert an apology in specified newspapers at his own expense, which may be considerable. Dr. Nast has not been required to make any such insertions. The action of the court is regarded as of real significance in medical circles, for, generally speaking, French judges are not specially indulgent to medical men, and have sometimes been regarded as giving them more than their deserts. Dr. Nast, it is clear, is regarded as having done public service in exposing a remedy which had received extravagant prominence in the press to such effect that sanatorium practice was endangered and patients seriously upset by the withholding of a remedy from which they had been led to expect so much. There is still a possibility that the inventor himself may get into trouble for having practised medicine without any qualification.

THE CHAIR OF MEDICINE IN THE UNIVERSITY OF ABERDEEN.

THE Regius Chair of Medicine in the University o Aberdeen is the oldest foundation for the teaching of medicine in Great Britain, and an interesting departure in filling the appointment has occurred, following the resignation of Prof. Ashley Mackintosh. Hitherto the Professorship has been held as a part-time appointment with a salary of £850 a year. Henceforth a salary of £1200 will be attached to the Chair, in view of the Professor being expected to devote more time to teaching and to the initiation and conduct of research. Further, the holder of the Chair becomes honorary physician to the Royal Infirmary of Aberdeen, and, having charge of beds, will be in a position to associate the activities of research with clinical practice. The appointment to the Professorship is made by the Crown on the recommendation of the Secretary of State for Scotland, and there should be, and quickly, strong candidates in the field, for the opportunities of doing valuable work are obvious, especially as additional assistance and full facilities for the conduct of research are to be provided.

MEDICAL STAFF OF THE MINISTRY OF HEALTH.—Following the retirement of Dr. F. J. H. Coutts, from the post of senior medical officer for tuberculosis, venereal disease and general institutional therapy, this appointment will be held by Dr. A. S. MacNalty, while Dr. J. Alison Glover has become deputy senior medical officer. Dr. A. W. J. MacFadden, the senior medical officer with supervision of food supplies, is succeeded by Dr. Thomas Carnwath, this section being enlarged to include therapeutic substances, medical aspects of water supply and the medical administration of the Local Government Act in London. Dr. Miles B. Arnold takes the place of Dr. J. R. Hutchinson as deputy senior medical officer to Dr. H. A. Macewen in the section of sanitary administration, and Dr. Hutchinson has been appointed deputy senior medical officer to Sir George Buchanan in the section of general health and epidemiology.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCXCVII.

TREATMENT OF THE TYPHOID FEVERS.

PART I.*

Typhoid fever is a disease peculiar to man. Paratyphoid fever, on the other hand, occurs both in man and in domestic animals—dogs, cats, pigs, rabbits, and parrots (Vincent and Muratet)—and may be transmitted from these animals to man. Three varieties of paratyphoid infection are described—para. A, para. B, para. C; of these para. B is the most frequent in the British Isles.

Differential Diagnosis between the Typhoid Fevers.

Though paratyphoid fever is usually less severe and of shorter duration than typhoid is wont to be, the same complications may occur in both infections, and for this reason precisely the same care and precautions are to be observed in treating the one as the other. In paratyphoid the incubation period may be shorter than the 12 days of typhoid; the onset may be abrupt, even with a rigor; the pyrexia is seldom of the continuous type, often showing a daily variation of 2° or 3°; termination by lysis may take place in the third week. In paratyphoid, symptoms referable to the respiratory system may dominate the clinical picture with or without physical signs of broncho-pneumonia. In paratyphoid, the septicæmic stage, during which diagnosis may be made by blood culture, usually lasts but three or four days, whereas in typhoid a positive blood culture is often obtainable for the first week or ten days; only in very grave cases does a demonstrable septicæmia persist. In paratyphoid, the colon may be the chief seat of ulceration; in typhoid, ulceration of the intestine is often confined to the Peyer's patches of the lower six feet of the ileum. The specific bacillus in paratyphoid B may be demonstrated in the stools more constantly than is the case of *B. typhosus* in typhoid fever—a fact which renders examination of the stool of great value in the diagnosis of paratyphoid. The leucopenia characteristic of typhoid fever after the first few days is inconstant in the paratyphoid infections, and may indeed be replaced by a moderate leucocytosis.

General Management of the Case.

As soon as typhoid fever is suspected the patient is confined strictly to bed; the earlier absolute rest is enforced the greater is the chance of recovery. Intelligent nurses for day and night duty are essential. The ideal room in which to nurse the patient is quiet, large, light and airy, getting the sun yet capable of being darkened, and with adequate lavatory accommodation close at hand. The bed is a single one, mounted on wheel castors, with a firm mattress, and so placed that the nurses can walk round it; not more than two pillows are allowed. A water bed is not necessary but an air ring is to be provided. When feasible, the patient's comfort is enhanced by the provision of two similar beds, one for day and the other for night; when the beds are wheeled side by side, the patient may be lifted from the one to the other with but little disturbance.

Special china and cutlery is set apart for the patient's sole use; and arrangements are made for disinfection of the nurse's hands, of the patient's excreta, and of all objects with which he comes in contact. The specific organism may be discharged in the stool, in vomit, in urine, in sputum, and in any purulent discharge which may be present; all such materies morbi demand disinfection. The fæces, after inspection, are thoroughly mixed with an equal volume of 1 in 20 carbolic solution, and allowed to stand for one hour before being disposed of; to the urine half its volume of 1 in 20 carbolic is added, and the vessel washed out with this solution after use. Sponges and cloths used for washing the patient are disinfected after use, and all bed linen and clothing soaked in carbolic before being sent to the laundry; the crockery is sterilised by boiling after use. Flies are denied access to the sick quarters.

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* Part II. will appear next week.

However ill the patient may be, the whole body is washed at least once a day with soap and water, the pressure points receiving frequent and special attention in order to prevent bed sores, to which end also, and to avoid hypostatic congestion, the patient's position is changed every four hours. The mouth also requires especial care; a thorough cleansing after each feed should be undertaken either by the patient himself or by his nurse. An efficient and pleasant mouth-wash is furnished by adding a teaspoonful of the following mixture to half a tumbler of water:—

℞	Liq. potassæ	ʒ 1
	Ac. carbol.	ʒ 4
	Tr. cocci	q.s.
	Aquam ad	℥ 6

Any tendency to dryness of the lips may be checked by the application of a simple ointment.

If the temperature rises above 103° F. the patient is cradled; when it exceeds 104° sponging with hot water (110°) is just as efficacious as is tepid sponging for the reduction of pyrexia, and is less likely to cause discomfort.

As a rule the typhoid patient is to be awakened at night when feeds are due; attempts are to be made to check mouth-breathing when it occurs, as thereby dryness of the mouth is aggravated.

The patient is kept in bed for at least two weeks after defervescence is complete; a week is occupied in the process of getting up, careful watch being kept for increase in pulse frequency which, should it occur, is an indication for more rest. In a case of any severity the patient will not be fit to return to work for three months.

Before the patient is discharged the stools and urine should be examined for the specific organism three times at five-day intervals. But even with three negative reports a carrier may be overlooked. The treatment of carriers is unsatisfactory; even when there is evidence of cholecystitis or of cholelithiasis removal of the gall-bladder may not be successful in curing the carrier state since the bile ducts may be infected. In order to prevent spread of the disease a carrier should not be permitted to work in the preparation or handling of food for human use, and prophylactic inoculation of contacts is advisable.

It is a wise precaution to give at once prophylactic vaccine to nurses and other members of the household who have not already suffered from the disease or been inoculated within two years. Three subcutaneous injections of mixed TAB vaccine are given at ten-day intervals; for an adult the first dose is 500 million typhoid and 250 million each of para. B and para. A. The dose is doubled at each succeeding injection.

Feeding.

The patient is not to be propped up in bed for feeding, or any other purpose, until the temperature has been down for at least seven days; fluids are given in a feeding cup or sucked through a tube, other articles administered with a spoon.

Throughout the whole course of typhoid fever the patient is encouraged to take food. Though milk is the mainstay there is no reason why certain solid articles should not be allowed, so long as the patient is able to masticate them thoroughly and has the desire for them; mastication increases the flow of saliva and is an important factor in keeping the mouth clean and in preventing septic parotitis. A liberal diet in the early stages helps to maintain the patient's strength, and so prepare him the better to withstand certain complications which may arise later, the incidence of which is not diminished by relative starvation. An accurate record is to be kept of the quantity and composition of all feeds given; in the choice of food, the patient's own likes and dislikes are carefully considered, but more must not be given than he is able to digest. In addition to the regular feeds at stated times, he is urged to take sufficient water or lemonade in between times to bring the total liquid consumption up to five or six pints in the 24 hours. This promotes diuresis and aids in the elimination of toxins. Should vomiting occur, all food must be withheld for a few hours; diarrhœa often indicates a diet too rich in fat; abdominal distension calls for a reduction in carbohydrate.

W. Coleman considers the typhoid patient's food requirement is from 60–80 calories per kg. of body-weight per diem—i.e., nearly 5000 calories for a man weighing 11 st.; it is important that the daily carbohydrate ration should not fall below 50 g. lest acidosis develop.

During the first week of the disease, if headache is troublesome, the appetite is apt to be poor though thirst is not seldom a complaint. At this stage the daily diet, exclusive of water, consists of 3 pints of milk, 2 eggs, 1½ oz. of cream, and 3 oz. of lactose (calorie value approximately 1550). A feed of, say, 6½ oz. is given two-hourly by day and four-hourly by night, the eggs being beaten up with four of the feeds or made into custard. Milk without egg may be flavoured with tea, coffee, chocolate, or cocoa, and given either warm or iced in the feeding cup.

During the first few days the diet is tentatively increased by the addition of lactose and of cream—say, 1½ oz. of each a day up to a total of 6 or 8 oz., thus raising the calorie value to about 2500. Barley-sugar may be appreciated, especially by children. At the end of the first week, or before if the patient will take it, rusks, breakfast biscuits, or thin bread (without crust) and butter, honey or jelly, junket or blancmange, or 2 oz. of pounded steamed or boiled white fish and a little apple or prune purée with cream may be added gradually to the daily ration. Eggs may be lightly boiled. Feeds are now given three-hourly by day, and the patient is urged to drink water, or lemonade with added lactose, in the intervals. No further addition to the diet is permitted until convalescence is well advanced, though the frequency may be reduced, and the quantity of each feed correspondingly increased when defervescence is established. Certain individuals assert their inability to take plain milk. If this statement proves to be true, the addition of citrate, grs. 2 to the ounce of milk, or the substitution of malted milk or junket and whey may have the desired effect. Failing this the diet is to consist of plasmon and gruel, made from fine oatmeal or Robertson's barley passed through a sieve, thick vegetable soups, carefully strained, mashed baked potato, tapioca or bread pudding with the above-mentioned quantities of cream and lactose.

Following the pyrexial period, if all goes well, the temperature remains subnormal for a week or ten days; should it not do so, and in the absence of other obvious cause, a relapse or recrudescence is likely. The probability of a relapse is greater if the spleen remains palpable, and if Ehrlich's diazo reaction, which usually disappears with the commencement of lysis, again becomes positive in the urine (Rolleston).

Ehrlich's Diazo Reaction.—Requirements. Fresh solutions:
1. Saturated solution of sulphanilic acid in 1 in 20 HCl.
2. 0·5 per cent. aqueous solution of sodium nitrite.
3. Liquor ammon. fort.

Technique.—Fill a test-tube one-third full of urine and add an equal volume of sulphanilic acid solution. Mix by inverting, and add one drop of nitrite solution. Shake to frothing, and add ammonia slowly. A positive reaction is indicated by a pink coloration of the froth, the urine becoming deep crimson.

A relapse is treated in the same fashion as the primary attack.

The Bowels.

The use of the bed pan is insisted upon from the very start of the illness until the temperature has been subnormal for at least seven days.

No aperient is given by the mouth from the end of the first week until at least ten days after defervescence is complete, lest ulceration still be present. Constipation and diarrhoea may usually be controlled by alterations in diet. It is most important that the stools be soft; if the fæces are hard or defæcation difficult, the amount of fat and lactose in the diet is increased, provided nausea and meteorism is not induced thereby. Should the addition of fat not be tolerated, the quantity of milk is reduced and an equal amount of beef-tea or clear chicken soup substituted. A dessertspoonful of liquid paraffin two or three times a day, or a glycerine suppository may help matters, but if the fæces are still hard or difficult to expel, a plain soap-and-water enema is given on alternate days. When diarrhoea —more than three of four actions in the 24 hours— does not respond to a reduction of fat, or to the substitution of malted milk for plain milk, it is necessary to give small doses of Dover's powder which may be combined with kaolin. Tenesmus, in association with diarrhoea, may be checked by a rectal wash-out with a pint of warm normal saline solution followed by a belladonna suppository, or starch and opium (tr. opii ♏xxx.–xlv. in starch emulsion ℥iv.) given cold through a catheter, the tip of which is inserted just beyond the internal sphincter.

Abdominal *distension* usually indicates a diet too rich in carbohydrate, but in profoundly toxic cases it may be paralytic in origin. Distension is a serious condition, and one which the physician must constantly be on the alert to detect when carrying out the daily inspection of the abdomen. At the first sign of distension the carbohydrate intake is reduced and the total fluid cut down to 3½ pints; milk infected with *B. bulgaricus* or *B. acidophilus* is useful in certain cases. When the colon is mainly affected, tr. asafetidæ ʒii. in mucilage of starch ℥iv. may be injected into the rectum. If the condition persists and is not associated with hæmorrhage, heat is applied to the abdomen, and an emulsion of ♏xx. of turpentine or a capsule containing ♏v. of oil of cinnamon given by mouth two- or four-hourly, and a half pint ox gall enema. Collosol kaolin ʒiii. in water ℥iv., given by the mouth three or four times a day is often useful. Should these measures fail, a hypodermic of eserine sulphate, gr. 1/200 combined with strychnine, gr. 1/60 must be given, and repeated in four hours if necessary; alternately, an intramuscular injection of pituitrin ½ c.cm., may be used.

Urine.

The quantity of *urine* passed is to be recorded. Retention of urine is not infrequent quite early in the disease; when fomentations fail to relieve the condition, which is usually of short duration, catheterisation at stated intervals is necessary. If "incontinence" occurs take care lest the condition be retention overflow; passage of a catheter may be necessary for diagnosis when meteorism is present.

Special watch is to be kept after the second week for the occurrence of bacilluria. In this condition the urine is generally pale in colour and uniformly turbid. The turbidity does not clear on standing, nor is it removed by ordinary filtration; the specimen gives a peculiar satiny shimmer when gently shaken.

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Special Articles.

THE ZONDEK AND ASCHHEIM TEST FOR PREGNANCY.

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RECENT work on the sex hormones has provided an entirely new basis for a test for pregnancy. In 1927 Zondek and Aschheim [1] described experiments showing that implantations of male or female pituitary tissue into immature female mice produced precocious sexual maturity. The most noticeable external changes were: (*a*) the canalisation of the vagina and (*b*) the appearance of œstrus, as judged by the vaginal smear. Post-mortem examination of these animals revealed that the uteri were hyperæmic and greatly enlarged; the ovaries were much increased in size, and there were present on them some minute dark spots—termed by Zondek and Aschheim "Blutpunkte." In the following account these are referred to as "corpora hæmorrhagica." Examination of sections of the ovaries from the treated mice showed that a very large proportion of the follicles present in the ovary had become mature; that the corpora hæmorrhagica were, in fact, unruptured follicles into which blood had been extravasated, and, further, that a number of corpora lutea were frequently to be seen, some of which contained a degenerating ovum. The corpora lutea of the latter type, which were evidently formed without previous rupture of the follicles, are the so-called "corpora lutea atretica." Later [2,3] these authors observed that during pregnancy a hormone producing effects closely resembling those brought about by implantation of anterior pituitary tissue appears in the urine; this observation forms the basis of the test for pregnancy now under consideration.

It may be remarked here that Smith and Engle [4] have arrived at slightly different conclusions as to the effects produced by implantation of anterior pituitary substance into immature animals. They find that ripening of the Graafian follicles and ovulation are the principal effects, and that atretic follicles are, in fact, *less* frequently seen than in the normal adult animal; also they do not find corpora hæmorrhagica. Whatever the explanation of this difference may prove to be, it is to be regarded as an important theoretical point which may be considered apart from any estimate of the practical value of the Zondek and Aschheim test. There is no doubt that the effects of injection of urine from pregnant women into immature mice are as described by Zondek and Aschheim, and that these changes can readily be obtained by the injection of small quantities of the untreated urine. The presence in the urine of a substance capable of bringing about the above results is considered by Zondek and Aschheim (*loc. cit.*) as diagnostic of pregnancy, and the results obtained on a large number of cases are brought forward by Aschheim [3] in support of this conclusion.

In view of the importance of a satisfactory means of diagnosing pregnancy, we decided to investigate the reliability of the test in this laboratory. The methods employed and the results obtained are described below.

Experimental.

Urine.—Specimens from the early morning urine were obtained where possible. When the urine had to be kept for a few days before testing it was stored in a refrigerator at -5° C. If some time was likely to elapse between the passing of the urine and its arrival at the hospital, a trace of tricresol was placed in the collecting bottle to prevent bacterial action. Very slight decomposition of the urine leads to a high mortality in the test animals.

Animals.—For each specimen five or more mice were used. Owing to the difficulty of raising the large numbers required, the mice were purchased from the breeders.* The age of the mice at the beginning of the test was 21 to 24 days, and it is essential that this latter age should not be exceeded. The average weight was 7·5 g., thus indicating that the animals were satisfactory in this respect.

Injections.—Each mouse received six injections of urine distributed as evenly as could conveniently be arranged over a period of 45 hours. The actual times of injection were:—

1st day ……..	12 noon ……..	6 P.M.
2nd day ……..	9 A.M. ……..	3 P.M.–9 P.M.
3rd day ……..	9 A.M.	

Originally the doses recommended by Zondek and Aschheim were used—namely, 6 doses of 0·4 c.cm. to one mouse, 6 of 0·3 c.cm. to another, and so on down to 6 doses of 0·2 c.cm. As we found that the mice receiving the largest doses sometimes showed less response than those receiving the small ones, we modified the procedure so that each animal receives 6 doses of 0·3 c.cm. It is then unnecessary to mark the individual animals. The only advantage in the varying dose seems to lie in the fact that with toxic specimens of urine the animals receiving the smaller doses sometimes survive, but it is usually preferable to obtain a fresh specimen and repeat the test. Not more than 1 drop of tricresol should be added to each 30 c.cm. of urine. The injections are made subcutaneously. Frank[5] states that in his hands the mice died during the test, before readings could be taken, but this has not been our experience. The mortality tends to be high when the investigator lacks experience, but rapidly diminishes with practice, when with the dose mentioned above only a few specimens of urine cause a serious death-rate.

The mice are killed on the morning of the fifth day and their ovaries and uteri are examined.

Interpretation of Examinations of Ovaries and Uteri.—The ovaries of the untreated mouse are small and contain unripened follicles; the uteri are thread-like, and the vagina is a solid cord of cells. Following the injection of urine a positive test is indicated by the presence of corpora hæmorrhagica or of corpora lutea in the ovaries. The former appear as red dots of varying size but frequently they are about the size of a pin's head. When present on the surface of the ovary they are easily seen and the appearance is quite characteristic. Occasionally they are very small, or are found in the body of the ovary, when their presence may be confirmed by squeezing the ovary, moistened with a drop of glycerol, under a coverslip and examining microscopically. In addition to the hæmorrhagic follicles, corpora lutea are frequently observed. They are most easily recognised by means of a lens. In a few cases it is found necessary to prepare serial sections of the ovaries, solely as confirmation of the macroscopic findings.

The presence in the ovary of either corpora hæmorrhagica or corpora lutea, or of both, constitutes a positive reaction. The test is reported as positive even if these changes occur in only one of the animals used. In our experience, corpora lutea are usually found to be accompanied by corpora hæmorrhagica, and in only four of a total of 126 positive tests were corpora lutea present without corpora hæmorrhagica. All four were normal pregnancies. Certain changes in the uterus, vagina, and vaginal smear are also usually observed. These are enlargement, thickening, and distension of the uterus, opening of the vagina, and sometimes the appearance of the cornified epithelial cells characteristic of œstrus, in the vaginal smear. These changes in the uterus and vagina, however, are due to the œstrus-producing hormone (œstrin), and are not necessarily indicative of pregnancy. The œstrin is derived either from the urine injected or else its presence is due to the liberation of increased amounts from the ovary of the mouse. Many workers have shown that during pregnancy the urine contains a much increased amount of œstrin (Zondek and Aschheim,[6, 2] Veler and Doisy,[7] Allan, Dickens, Dodds, and Howitt[8]). Œstrin, however, has no observable effect on the ovaries, and its presence is indicated solely by its effect on the uterus and vagina. The changes produced in the ovaries upon which the diagnosis is based must, therefore, be due to some other cause, and as has been stated, they are attributed by Zondek and Aschheim to the hormone of the anterior lobe of the pituitary.

Results.

237 specimens of human urine have been examined by the method described. Since there is no difficulty in the clinical diagnosis of advanced pregnancy we have, as far as possible, obtained urine from early pregnancies. In this we have been fortunate in having the coöperation of Mr. L. Carnac Rivett, who has secured most of these cases from Queen Mary's Hospital, Stratford, where the demand for accommodation leads to very early application to the hospital. Table I. shows the collected results.

TABLE I.

Specimens.	Cases.	Test pos.	Test neg.	Per cent. error.
Females definitely known—				
(*a*) to be pregnant	126	122	4	3·2
(*b*) not to be pregnant	82	1	81	1·2
Males	6	0	6	—

The results given in Table I. were mainly from cases of simple pregnancy. In addition the series given in Table II. reproduces the results obtained in a number of other conditions.

TABLE II.

Condition.	Cases.	Test pos.	Test neg.
Non-pregnant.			
Normal female—			
24 hrs. after delivery	1	1*	0
48 ,, ,, ,, ...	1	0	1
Lactating	2	0	2
Menstruating	2	0	2
Young girl, 3 months	1	0	1
,, ,, 10 years	1	0	1
Ovarian tumour, benign	2	0	2
After abortion (4 days)	1	0	1
Menopause	5	1*	4
Various gynæcological conditions ..	5	0	5
Extreme obesity	1	0	1
Menorrhagia	1	0	1
Pituitary tumour	1	0	1
Fibroid of uterus	1	0	1
Total	25	2	23
Pregnant.			
Normal female 1½ hrs. before delivery ..	1	1	0
Pulmonary tubercle and pregnancy ..	1	1	0
Total	2	2	—

* Weak.

Discussion and Results.

From Table I. it is clear that a positive test may be relied upon in almost all cases. Only one specimen from a total of 208 pregnant and non-pregnant women gave an incorrect positive result. This case, a woman aged 46 years at the menopause, clinically presented no unusual features. The test was repeated on two separate specimens of urine. The first specimen gave a very feebly positive result in one of five mice, which showed on microscopic examination the presence of corpora lutea in both ovaries. The test was repeated when the reaction was negative. A new specimen was then procured, when the result was again positive, a small corpus hæmorrhagicum being present, in addition to a corpus luteum in the ovary of one of the eight mice used for the test; the remaining seven mice were negative. A positive result was not obtained in any of the other five cases at the menopause examined, and negative findings are reported also by Zondek and Aschheim in numerous cases. A possible explanation is furnished by the work of Fluhmann,[9] who has shown that after castration, natural or artificial, increased amounts of anterior pituitary hormone are found in the patient's blood. For some reason this particular woman excreted an amount of the hormone into the urine sufficient to give a weakly positive reaction to the Zondek and Aschheim test.

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* The Mousery, Rayleigh, Essex.

Unlike the tests depending on the presence of the œstrus-producing hormone in the urine, the Zondek and Aschheim reaction is positive early in pregnancy. For example, in one case in which the onset of the menstrual period was only nine days overdue an intensely positive reaction was obtained; and in general it can be stated the test is certainly no weaker in the early cases than in the later ones.

The possible error is somewhat greater when a negative result is obtained. Of 126 pregnant women examined four showed a negative test. One woman miscarried three weeks after the performance of the test. The remainder proceeded to full term normally. The specimens of urine were not toxic, and the test proceeded normally in all four cases.

With regard to Table II., the rapid disappearance of the hormone from the urine following delivery or abortion is well shown. The persistence of the corpus luteum during lactation suggested that the urine might possibly contain sufficient luteinising hormone to give a positive test; this expectation was not fulfilled. At the onset of menstruation also the test was negative, and the hormone was not present in the urine of young girls, although the growth-promoting function of the anterior lobe is presumably very active at this time. Urine from one case of pituitary tumour in a girl of 17 has been tested. The patient showed typical optic phenomena, and the diagnosis was confirmed by X ray examination. The latter showed the growth to be confined to the posterior region of the pituitary fossa as indicated by erosion of the posterior clinoid processes. The result of the test was negative. The cases at menopause have already been described, and this is the only condition in Table II. where any confusion exists.

The animal experiments summarised in Table III. show that the test is not directly applicable to the rabbit, cat, or cow. In these species the urine was often so toxic that all the mice died, even when the urine was neutralised with acid before use, and occasionally after only one injection. Those tests where the survival was sufficiently high to permit any conclusion were uniformly negative. The results with the cow are disappointing in view of the practical importance of the diagnosis of pregnancy in this animal. We are greatly indebted to Dr. R. F. Montgomerie, veterinary adviser to the University College of North Wales, Bangor, for the trouble which he has taken in supplying us with these specimens.

TABLE III.—*Experiments with the Urine of Animals.*

Animal.		Animals.	Specimens.	Result of tests.
Rabbit pregnant		1	1	Neg.
		2	2	Both toxic.
" ovariectomised ..		2	2	Both neg.
Cats pregnant		1	1	Neg.
		2	2	Both toxic.
Cows (believed pregnant) ..		7	8	All toxic.
		2*	2	Both neg.
Cows' urine diluted before test.	× 5	2	2	"
	× 10	2	2	"

* One served 7 weeks previously: now definitely pregnant.

Conclusions.

Taken together, the results show that in the human subject the test may be relied upon with some confidence, the percentage of error being low for such a reaction.[†] Exceptions described are: (*a*) one case at the menopause giving a positive reaction; (*b*) four normal pregnancies giving a negative test without apparent cause. With this one exception all tests in which a positive result was obtained were correct. Clinical tests are now being discontinued, since the animals are required in connexion with work now in progress on the chemistry of the substances involved.

We wish to express thanks to those who have kindly placed material at our disposal, particularly to Mr. L. Carnac Rivett, Mr. F. W. Roques, and Mr. A. L. Walker, and also to Prof. E. C. Dodds, for the interest which he has shown in this investigation.

References.

1. Zondek, B., and Aschheim, S.: Klin. Woch., 1927, vi., 248.
2. " " Ibid., 1928, vii., 831; Zondek, B.: Ibid., 1928, vii., 1401.
3. Aschheim, S.: Klin. Woch., 1928, vii., 1453; Zeitschr. für ärtliche Fortbildung, 1929, xxvi., 5.
4. Smith, P. E., and Engle, E. T.: Amer. Jour. Anat., 1927, xl., 159.
5. Frank, R. T.: The Female Sex Hormone, Illinois, 1929, p. 196.
6. Zondek, B.: Klin. Woch., 1928, vii., 465.
7. Veler, C. D., and Doisy, E. A.: Proc. Soc. Exp. Biol. and Med., 1928, xxv., 806.
8. Allan, H., Dickens, F., Dodds, E. C., and Howitt, F. O.: Biochem. Jour., 1928, xxii., 1526.
9. Fluhmann, C. F.: Jour. Amer. Med. Assoc., 1929, xciii., 672.
10. Wagner, G. A.: Deut. Med. Woch., Dec. 20th, 1929, 2125.

MEDICINE AND THE LAW.

Dr. Knowles's Successful Appeal.

IT is understood that the Judicial Committee of the Privy Council will not announce till February next the reasons for the decision announced on Nov. 19th, to advise His Majesty to allow the appeal of Dr. Benjamin Knowles from the judgment by which he was found guilty at Kumasi of the murder of his wife.

Dr. Starkie's Sentence Reduced.

Dr. Richard William Starkie, sentenced to 12 months' imprisonment in the second division at Maidenhead, on Dec. 2nd, for offences against the Dangerous Drugs Act, appealed to the county quarter sessions at Reading on Dec. 20th, on the ground that the sentence was excessive. Counsel prosecuting for the Crown recalled the facts. The appellant, an unregistered practitioner, had admitted his signature on 16 prescriptions for heroin presented during three months on behalf of a patient named Mrs. Melville. He had told a police inspector that on different *occasions he had given blank sheets of paper containing* his signature to a man named Melville or Vilmer. The appellant's counsel obtained the answer that there was no suggestion against Dr. Starkie of carrying on a traffic in drugs. He said that two registered practitioners had been persuaded by Vilmer to act as Dr. Starkie had done, and they had been convicted for not keeping proper records. Counsel also objected sharply to the statement of the prosecution in the court below that he had instructions from the Home Office to say that the case was regarded as a serious one. *He protested that this was improper, and that* the officials of a Government department had no right to form and publish their conclusion about a case without having heard a single word about it in

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[†] Whilst the present paper was in the press, a review appeared by Prof. G. A. Wagner [10] of some recent German work upon this test. In the main, his conclusions are in agreement with our own.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Birth Control.

A NATIONAL campaign by birth control advocates was launched recently with a conference at Columbus, Ohio. The campaign has for its object the repeal of Federal legislation which now prohibits the use of the mails for any matter giving information on contraception or for the transport of contraceptive materials. The plan is to organise the country in four divisions carrying birth control propaganda into every State. The moving spirit of the conference was Mrs. Margaret Sangar who advocated control of conception under the following conditions: (1) to prevent the transmission of diseases to the new-born; (2) to prevent the birth of mentally deficient children; (3) to prevent illness, disability, and death among women who are physically unfit to bear children; (4) to prevent childbirth in adolescence; (5) to enable couples to regulate the size of their families in accordance with their economic means; and (6) to prevent births during the first two years of married life. The last recommendation is supposed to make it easier for married couples to make the psychological adjustments necessary in marriage. It must not be supposed that it would receive the approval of all supporters of the movement. Indeed, in the conference itself there were obvious disagreements about the purposes and consequences of birth control. One speaker regarded it as a cure for overcrowding and a prevention against war. Mrs. Sangar herself now takes the view, so strongly supported by Pearl's studies of population growth, that birth control does not mean limitation but selection of the population.

Fatal Automobile Accidents.

Early estimates of the total of deaths from automobile accidents during 1929 by the American Automobile Association reach the appalling figure of 27,000 deaths. This is greatly in excess of last year's mortality from the same cause. For the 52-week period ending Nov. 2nd the city death-rate is 25·6 per 100,000, compared with a rate of 22·1 per 100,000 a year ago. Camden, N.J., leads with a rate of 74 and Kansas City is at the bottom of the list with a rate of 10. The main cause of the increasing death-rate is probably the increasing congestion of traffic. The Automobile Association estimates that 2½ million cars will be added to the traffic during this year and make a total of approximately 27 million cars on the roads.

Overcrowded Prisons.

The extent of overcrowding in Federal and State prisons is emphasised in a recent statement by Paul W. Garrett, the editor of the "Handbook of American Prisons." He asserts that 124,783 prisoners are housed in buildings designed to hold only half that number. This "aggravates every problem of sanitation and puts an intolerable strain on the physical and mental health of every man so confined." The mistake made by many States as well as by the Federal Government is that they have passed new laws without making provision for the resulting increase in offenders. Perhaps the most serious result is the lack of means to offer employment to the luckless prisoners. The demoralising effect of this enforced idleness is obvious enough. That prison life may, on the other hand, afford excellent opportunities for reformatory medical work is shown in a report of Dr. Charles C. Sweet, the chief medical officer of Sing Sing Prison. This prison is fortunate in possessing a new hospital, a five-storey fireproof structure providing beds for 125 patients. A block of 88 cells attached to the hospital provides accommodation for chronic invalids. Sing Sing is a receiving prison whose inmates are soon transferred to other institutions. The medical staff do their best to send on the prisoners in better physical condition than when they arrive. More than 7000 injections of arsaphenamine have been given during the last fiscal year (positive Wassermann reactions are found in 12 per cent. of white prisoners and in 42 per cent. of the negro prisoners). Other needs are disclosed at the routine physical examination given to all prisoners on admission and the men are invited to submit to corrective treatment or sign a statement of refusal. In the past three years more than 90 per cent. have accepted the former alternative.

Cost of Medical Care.

Two years after its inception the Committee on the Cost of Medical Care has issued an interim report. At first glance it is rather a disappointing document. "The Committee . . . hopes that is may be possible to work out plans for the provision of adequate and efficient therapeutic and preventive treatment for all the people. . . . What plans will be developed the Committee does not know. After a year and a half of study, however, it believes that its investigation will define the difficulties of the present situation and will result in helpful recommendations." A somewhat undersized infant, one might say, after nearly two years of labour. Meanwhile, the State of New York is inaugurating a practical experiment which it is hoped may solve the problem locally, when the new public welfare law goes into effect at the beginning of the New Year. Whereas the old poor-law states that officials *may* give care in a hospital to an indigent sick person, the new public welfare law states that the official *shall* give any type of medical care needed, not only to completely destitute persons but also to "persons otherwise able to maintain themselves who cannot secure necessary medical care." The old law mentions care in a hospital, the new law care in the home, in a dispensary, hospital, or elsewhere. Illness need no longer be acute to arouse the interest and aid of the State. Prevention through early treatment of remediable defects is clearly envisaged. In this way the State may actually save expense as well as the lives of its citizens. To Englishmen it will perhaps not appear so very surprising that a State should recognise the maintenance of health as a proper public function, but in this country, where anything that savours in the least of "State medicine" is regarded with emotional horror by the great majority of physicians, the new law takes on an almost revolutionary significance.

A Medical Information Bureau.

It is now just over a year since the Medical Society of the County of New York and the New York Academy of Medicine jointly founded a medical information bureau. During the first year of its activity the bureau has sent out over a thousand letters and answered as many inquiries by telephones as by the post. The inquiries have come from all parts of the world and have been of the most diverse character. One inquirer had heard on the authority of "a doctor in England" that many women have their middle toes removed so that they may wear fashionable shoes and wanted to know whether the report was true or not. The bureau has been used by a number of organisations both commercial and philanthropic, including the Better Business Bureau and the newspapers. It is of interest to note that several of the larger advertising concerns have used the bureau as consultant in censorship. The bureau has also been active in "releasing" to the press statements concerning quackery and articles of popular health instruction. The bureau looks forward to increased activity and rapid growth in the coming year.

Public Health Services.

THE MINISTRY'S INSTRUCTIONS TO M.O.H.'S.

CIRCULAR 1048 of the Ministry of Health, issued on Dec. 5th of last year, indicates that the instructions to medical officers of health on drawing up their reports for 1929 are the same as for the previous year, except that reference to action under the statutory provisions repealed by the Nursing Homes Registration Act, 1927, is to be disregarded. The circular gives notice that in future the Registrar-General will furnish to all medical officers of health particulars of stillbirths by sex and legitimacy, and the medical officer is asked to include these particulars in his report. In the 1928 reports no general rule was observed. In some cases the registered stillbirths were given, in some cases the notified only, and in other cases there was no reference to stillbirths at all. In the past it has been our usual practice to discontinue comments on the annual reports after the close of the year of issue. The 1928 reports were, however, issued somewhat later in the year than usual owing, we understand, to pressure in the Registrar-General's office, which delayed the sending out of the usual statistical information to medical officers of health. We propose therefore to continue our comments on the 1928 reports for some issues in the new year.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

TEN METROPOLITAN BOROUGHS.

THE following are some 1928 statistics of ten metropolitan boroughs :—

Name of borough and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Chelsea .. .. (63,630)	12·6	13·5	1·19	2·00	1·6	3·1	49/16	27	3·7
Hackney .. (217,200)	16·0	11·7	0·85	1·56	1·8	2·1	67/27	27	4·3
Hampstead .. (85,880)	11·6	11·6	0·53	1·95	1·7	2·1	54/19	13	6·0
Islington .. (324,700)	17·8	12·8	1·12	1·63	2·2	2·2	64/24	50	4·3
Poplar .. .. (162,000)	19·9	11·8	1·10	1·26	2·1	1·8	71/23	44	2·5
Southwark .. (181,300)	19·2	12·7	1·27	1·39	2·1	2·4	70/24	44	3·2
St. Marylebone (104,000)	12·7	11·9	0·88	1·45	1·6	2·2	80/26	41	6·8
St. Pancras .. (205,600)	15·9	12·8	1·08	1·59	1·9	2·2	80/25	50	2·1
Wandsworth.. (347,300)	13·6	10·9	0·85	1·45	1·4	2·0	50/23	23	4·5
Woolwich .. (141,100)	15·5	11·0	1·17	1·48	1·5	1·8	50/22	22	5·7

Relation of stillbirths to live births: Chelsea, 1·9 per cent.; Hackney, 3·7 per cent.; Hampstead, 3·6 per cent.; Islington, 2·5 per cent.; Poplar, 3·1 per cent.; Wandsworth, 2·0 per cent.; and Woolwich, 3·5 per cent.

Chelsea.

Dr. W. H. L. McCarthy's report shows that full use is made of the many voluntary agencies in the borough. Thus the Chelsea Health Society and School for Mothers, which employs four "part-time" medical women and a staff of health visitors, conducts the clinics and treatment centres in return for a subsidy of £750. Lady Melchett is the chairman of the committee, and she and Lord Melchett have purchased a large site adjoining the society's present premises with a view to erecting thereon a new maternity and child welfare centre. The tuberculosis dispensary is located at the Brompton Hospital, and the tuberculosis officer, Dr. W. J. Fenton, is one of the honorary physicians to the hospital. The borough council makes an annual grant of £1000 to the hospital and an additional payment of £160 for home visitation by the nurses. The borough council also subsidises the Nursing Association, the Day Nursing, and the Invalid Children's Aid Association, and has representation on the committees of these voluntary societies. Payments are made to the Ormond Maternity Home (six beds), the only institution of this kind in the borough, for the admission of necessitous maternity cases, and also to private midwives for domiciliary attendance, the net cost to the council for these services being £28 10*s.* 6*d.* for 1928.

Complaints of a serious nuisance from the emission of smoke and grit by the generating station of the London electric railways in Lot's-road gave rise to a conference and the promise of the installation of new boiler plant and suitable grit-arresters. Owing to the overflowing of the Thames on the night of Jan. 6th–7th, 33 basements and ground floors of inhabited premises were flooded, resulting in much hardship and distress, and the ruin of a large amount of furniture and household equipment. Energetic relief measures were adopted and no outbreak of disease was traced to the flood. An interesting survey of housing is given. A great part of Chelsea is comprised in the Cadogan and Sloane Stanley estates, and with the expiry of the leases the old type of small house has largely disappeared, and during the last 30 years some 18,000 Chelsea residents of the working and small trader class have had to migrate. Up to the war various trusts had however provided accommodation for 7000 persons of this type. Since the war the position has been more difficult for tenants of small means. The borough council has provided a block of 56 flats at a weekly rental, including hot water and electricity, of from 25*s.* to £1 14*s.* 3*d.* Two other schemes are in hand for the erection of working-class dwellings by the Guinness and Peabody Trusts respectively. Overcrowding exists mainly in the western district and has been little improved during the year. An effort is made to move overcrowded families to the housing estates of the County Council, 39 such families having been moved during the year, but in many cases the tenants object to being removed so far from their work. An improvement scheme known as "World's End Passage" in the western district has been approved and will result in the erection of 62 flats for 370 persons on the cleared site. There are a large number of houses let in lodgings with insufficient accommodation and conveniences for the several occupying families. Other problems are the dirty and destructive tenant and houses occupied by old people unable to look after themselves. It is hoped to deal with the latter under the L.C.C. Act, 1928, by removal to suitable institutions.

Hackney.

Dr. G. H. Dart mentions that a diphtheria immunisation clinic, conducted by Dr. F. J. Porter-Smith, has been opened. The work has proceeded smoothly, but it is thought that the education authority might give more assistance in making the clinic known. The certificates of immunity granted numbered 292 and 133 children were under treatment at the end of the year. Good results are claimed for the light treatment clinic by Dr. Dorothy Gere. The 111 cases treated included 30 of malnutrition, 11 of failure to gain weight without apparent cause, 21 of rickets, 9 of marasmus, and 8 of debility after acute illness. Dr. Dart considers that the restrictions put by the Ministry on the supply of nursing assistance and milk to mothers are unreasonable. He also describes the difficulty experienced in getting adequate repairs to dilapidated property carried out. The borough council have in hand the erection of 132 flats and 92 maisonettes.

Hampstead.

In 1925 it was estimated that some 2000 Hampstead families were living in an overcrowded condition. During 1928, as the result of the borough council's action, 110 families were moved to the L.C.C. estates at Wormholt and Watling, making with previous removals a total of 142. The inclusive weekly rents of the houses on the Wormholt estate varied from 14*s.* for a three-roomed flat to 21*s.* 6*d.* for a five-roomed cottage. The Watling rentals are somewhat higher. When a house has been vacated by such a removal, there is no power to prevent its being immediately overcrowded again, but only power to deal with the new overcrowding after it occurs. The borough council has, however, been most successful in preventing recurrence of overcrowding by getting into touch with the person responsible for the reletting of the vacated house. Nearly half of the total births (1001) occurred in hospitals or nursing homes. An analysis was made of the available housing accommodation in 340 of the 538 births which occurred at home. Of these 340 births—11·5 per cent. occurred in one-roomed tenements, 34·4 per cent. in two-roomed, and 40·9 per cent. in three-roomed. In three of the one-roomed tenements there were 5 occupants and in one 6 occupants before the birth. In one of the two-roomed tenements there were 8 occupants, in two 9 occupants, and in one 10 occupants prior to the birth of the baby. For the purpose of this investigation kitchens were counted as rooms, but not sculleries, bathrooms, &c. The borough council subscribes £1 for every Hampstead mother confined in Queen Charlotte's Hospital. The municipal prematernity clinic is conducted by a "part-time" lady doctor and was attended by 320 new cases.

Dr. Frank E. Scrase reports that the by-law made by the council as to the fouling of public footways by dogs on the lead came into force in September, 1927, and was well advertised, and that the council decided to take action against offenders reported during 1928. Convictions were obtained in four cases.

Islington.

Dr. G. Clark Trotter gives an instance where the notification of births proved a check on the accuracy of registration. A birth was registered and on investigation as to why it had not been notified, it was found that a woman had adopted a child and re-registered its birth as a child of her own and her husband, an absent seaman. The Registrar-General took proceedings and the woman was fined 10*s.* The maternity and child welfare work is conducted at four voluntary centres with a coördinating committee. The work includes antenatal, light, and dental clinics. One centre has a postnatal clinic where the mothers are examined six weeks after confinement. The balcony of the "west" centre was fitted with vitaglass during the year. An outbreak of small-pox in an Islington institution involved a large amount of work but did not affect the borough itself. In the investigation of puerperal fever the Metropolitan Asylums Board have provided facilities for the examination of swabs from persons attending the confinement. In one fatal case of puerperal sepsis a swab from the eye of the handywoman in attendance showed *Streptococcus viridans* and in another a swab from the septic finger of a handywoman showed hæmolytic streptococci and staphylococci. A summary from the "Dawes" report is given showing that Islington sends great quantities of refuse to dumps in Hertfordshire, and that the management of the tipping is much better conducted than formerly. A circular was sent to all dairymen in the borough asking them to prevent roundsmen from depositing broken glass in the roadway. Owing to complaints as to indifferent milk sold at the Dairy Show at the Agricultural Hall, the inspector went to a stall over which were two notices "Pure New Milk 2*d.* per glass" and "Milk with cream added 6*d.* per glass." A 2*d.* glass of milk was purchased and found to be deficient in fat 54 per cent.

The 37 cases of overcrowding dealt with during the year only represented a proportion of those encountered owing to the difficulty of finding other accommodation. Application was made to the L.C.C. for housing accommodation for 174 "special hardship" cases. During 1928 52 houses were demolished under a L.C.C. improvement scheme and 24 were converted into business premises. Successful prosecutions under the Sale of Food and Drugs Act included a considerable number for liniment of turpentine not in accordance with the B.P. standard and for prescriptions inaccurately dispensed.

Poplar.

Dr. W. Allan Young reports that the overflowing of the Thames affected 1141 houses and involved a large amount of work in the cleansing and disinfection of premises. The flood waters left behind a more or less offensive sludge. Floor boards had to be lifted, water pumped out from underneath, coal had to be supplied for drying, and lime and disinfectants were freely used. In July the flooding of 18 houses in North Bow by the blocking of a main sewer occurred and similar operations had to be carried out. In June a diphtheria immunisation clinic was opened at the new maternity and child welfare centre in Wellington-road, under the charge of Dr. F. J. Porter-Smith. At the close of the year 29 children had been immunised and at the time of writing the report the numbers attending for treatment had considerably increased. In reply to an inquiry from the metropolitan boroughs' standing joint committee on schemes for dealing with acute rheumatism in children, the Poplar Council considered that if a rheumatism supervisory centre could be established at one of the large general hospitals, with sufficient beds for several neighbouring boroughs and a convalescent hospital with education facilities could be established by the L.C.C. or M.A.B., coöperation between Poplar and adjoining boroughs in a scheme might be possible.

Child welfare work is divided between the borough council and the Royal College of St. Katharine. Dr. H. St. H. Vertue, the consulting physician of the municipal observation wards, shows that satisfactory and permanent results were obtained in most of the ill-thriving babies admitted. A children's consultation centre has been established at the London Hospital and during the year 16 cases from Poplar centres were referred to it. Antenatal work is steadily increasing and the popularity of the artificial light clinics with the mothers is shown by an increase in the attendances of 3678 over the 1927 figure to 10,128. For the first time on record there was no death from puerperal sepsis in Poplar. Dr. Harold Waller, the senior medical officer of the Royal College of St. Katharine, in his report deals with the campaign against the overclothing of children. He, of course, admits that artificial light treatment has its place and has served a useful rôle educationally, but he goes on to show with illustrations how much good can be achieved by natural sunlight and fresh air in a garden such as they have at the back of the College.

Southwark.

Dr. H. Wilson reports, as outstanding features of the past year, an outbreak of small-pox, which had not appeared in the borough for 20 years, and the holding of a most successful health week and exhibition. There were 19 cases of small-pox, mostly of the mild type, with one death. The housing problem is still acute and overcrowding can only be overcome by deportation. Many residents, however, object to being removed from a central position to a distance from their work and, if they do move, not infrequently return. During the year 133 families were moved to the L.C.C. estates. One slum area has been cleared and the preliminary steps with regard to a second are in progress. Sutherland House has been purchased for the maternity and child welfare scheme, and the work of two centres has been transferred there. Much antenatal work is done at Guy's Hospital and it is proposed to have special antenatal sessions at some of the municipal centres. The tuberculosis officer, Dr. J. T. Crowe, refers with satisfaction to the work done by the open-air schools for tuberculous children at Bermondsey and Clapham Common, and to the value of the L.C.C. scheme for the boarding out of the children of infectious tuberculous cases. He thinks the results of light treatment at Guy's Hospital, perhaps owing to poor food and indifferent homes, have not come up to expectations. This form of treatment will probably be discontinued but Finsen light treatment for lupus will go on. An important part of the health department work consists in the examination of food arriving at the wharves, and the certifying of food products exported to foreign countries. Considerable damage and inconvenience was inflicted by flooding at the north end of the borough and every assistance was given in the cleansing of premises and the drying of damaged belongings.

St. Marylebone.

Dr. Charles Porter mentions, as two noteworthy occurrences a small outbreak of small-pox (30 cases with no deaths) which was limited to St. Marylebone Home and Hospital, and the advancement of the Carlisle-street improvement scheme to a further stage. The area to be dealt with is the largest ever represented in the metropolis, covers 7 acres, and affects 340 premises and 2832 persons. The scheme now awaits the decision of the Ministry. Dr. Porter deplores the large number of registered food stalls in the market streets. The highways committee refuses registration when storage accommodation is unsatisfactory, and the necessary improvements cannot be carried out. Dr. Mabel Brodie has been appointed to conduct a diphtheria immunisation clinic and at the end of the year 60 children under 5 and 29 over 5 had been completely immunised. The public analyst, Mr. J. F. F. Rowland, would like to see a standard fixed for manufactured food products, such as lemon-cheese, which may now contain hardly any of the expected ingredients.

St. Pancras.

Dr. G. Sowden mentions that the borough council's Somers Town housing scheme reached a further stage, when the first block of 44 tenements was opened by H.R.H. Princess Mary on July 25th, 1928. Two further blocks of 44 flats are nearing completion. The weekly rents, inclusive of rates and water, are 13*s.* 7*d.* for a two-roomed tenement, 16*s.* 5*d.* for a three-roomed, and 18*s.* 8*d.* for a four-roomed. Each tenement includes a kitchen with gas cooker, copper, bath, sink, larder, and dresser. There is a shortage of housing accommodation for poorer persons with irregular employment or large families, and the housing provision made by the L.C.C. estates is beyond their reach. A cheaper house is urgently needed for such families, says Dr. Sowden, and should be centrally situated in order to lessen the cost of travelling to and from work. Dr. Sowden objects to the method of calculating maternal mortality from childbirth. The rate is given per 1000 live births, but is swollen by the inclusion of deaths incidental to pregnancy in its early stages. For example, of 33 cases of puerperal fever recorded in St. Pancras during 1928, only 22, and of five maternal deaths only two, followed the birth of a viable child. The remaining 11 cases and three deaths followed the occurrence of miscarriages, the total number of which is an unknown quantity. Further, one of the four deaths classified as puerperal sepsis was found on investigation to be due to procured abortion.

St. Pancras was visited by a severe epidemic of measles, which began in December, 1927. Measles is notifiable in St. Pancras, and for the first time during an epidemic preference was given to measles over scarlet fever, as regards admission to hospital. Dr. Sowden is disappointed with the results obtained but admits that statistics on a larger scale are necessary before any definite opinions can be expressed. Baldly, the results were as follows: 426 cases were admitted to M.A.B. hospitals and 33, or 7·7 per cent., died; 242 cases were admitted to Highgate Hospital, of whom 58 died, or 23·9 per cent.; while 2030 were nursed at home, of whom 24, or 0·8 per cent., died.

Wandsworth.

Dr. F. G. Caley says the residents of Wandsworth are fortunate in having 1202 acres of parks and open spaces in their area of 9190 acres, and also in having easy access to Wimbledon Common and Richmond Park. The council's obstetric consultant, Dr. Leonard Phillips, investigates any maternal deaths which present special difficulty. There were 88 cases of small-pox with no deaths, and in several instances persons actually suffering from small-pox were found following their usual occupations. At two diphtheria immunisation clinics, by the end of the year, 713 cases had been treated; 621 were negative on retesting and 92 were still positive when last tested. In three instances children, who had been treated but were not thoroughly immunised, had attacks of diphtheria so mild as to be negligible. Special arrangements had been made beforehand to deal with the usual biennial epidemic of measles. Measles is not notifiable in Wandsworth, but a successful effort to search out the cases at an early stage was made by close coöperation between the health visitors and school nurses, and eventually five temporary health visitors were engaged to deal with the epidemic. Nursing or admission to hospital when required were arranged for without delay. The cases found during the nine months of the epidemic numbered 4566, and the deaths during the same period were 38. This is a smaller fatality than in previous epidemics of similar magnitude. The number of cases removed to hospital was 236, but the case-fatality of the hospital-treated cases is not given. About 300 premises were affected by the Thames flooding. Energetic relief measures were adopted and 40 children from the area involved were sent into the country for a fortnight by the Children's Country Holiday Fund.

Woolwich.

Dr. J. Macmillan mentions as one of the important events of the year the opening of the Woolwich War Memorial Hospital. It is a general hospital with a small maternity section and an X ray electro-therapeutic department. The Woolwich Council have made capital contributions and reserve 12 beds for children under 5 years of age and accommodation for 66 maternity cases per annum. They have already provided for another 144 maternity cases at the British Hospital for Mothers and Babies. Both these hospitals have an antenatal clinic attended by the mothers who are to be admitted and both provide antenatal in-patient treatment when needed. The electrotherapeutist of the War Memorial Hospital, Dr. J. E. A. Lynham, conducts the municipal light clinic which was opened in October, 1927. He reports good results in debilitated children, marasmic babies, and rickets. Of 471 cases who have been under treatment, 177 are classed as much improved or cured, 80 as improved, 39 as stationary, 93 as still under treatment, and 73 as having ceased treatment. Dr. Lynham explains the large number who have abandoned treatment by the fact that at the beginning there was a boom and the mothers expected miracles, but on being disillusioned they found it inconvenient to attend, especially from a distance.

The Eltham housing estate of the borough council will be completely developed by the erection of another 142 houses. The estate covers 334 acres and will include 2178 houses, about half of brick and half of "Easiform" concrete. There are 1438 "A" houses with three bedrooms, 696 "B" houses with three reference to the occupation of the husband will be fully considered, though such supplementary tabulations cannot be undertaken until the completion of the census tabulations, which constitute in part the material required for their preparation. With regard to the second question, the matter will be very fully considered before the programme of supplementary tabulations is decided upon. But I may observe that it was not found advisable in 1921 to attempt any compilation of the mortality of the female population by reference to female occupations for the reason, among others, that approximately 10 per cent. only of the female population was returned as gainfully or industrially occupied.

Thames Floods and Public Health.

Sir KINGSLEY WOOD asked the Minister of Health whether he had any information as to the damage to health and property owing to the excessive Thames floods, particularly at Canning Town and the Tidal Basin areas; and whether he was taking any steps to consult the West Ham Council and other authorities with a view to the prevention and mitigation of such floods in the future.—Mr. GREENWOOD replied: I am not aware that there has been any flooding in the Canning Town and Tidal Basin areas during the recent abnormal weather conditions. The town council of West Ham have special powers with regard to the prevention of floods and the responsibility must rest with them, and with other authorities similarly situated, as to the extent to which such powers are exercised.

TUESDAY, DEC. 24TH.

Purchase of Radium.

Mr. MANDER asked the Minister of Health whether it was intended to restrict the purchase of radium from Radium-Belge to one firm; and, if so, the reason for that and for the exclusion of other firms.—Mr. GREENWOOD replied: I would remind the hon. Member that, as has already been stated in the House on more than one occasion, the Radium Trust are not appointed by me, but are constituted by Royal Charter. I am not in a position to anticipate any future decision which may be taken by the Trust on the matter referred to in the question.

Review of Service Pension Awards.

Sir GEORGE BOWYER asked the Minister of Pensions how many cases of ex-Service men's pensions had been reopened, although outside the time limit, during the last five months.—Mr. F. O. ROBERTS replied: About 180 fresh awards were made during the period referred to and, in addition, medical treatment was provided in some 60 cases of slight wound.

Regulation of Scottish Charities.

Sir GEORGE BERRY asked the Secretary for Scotland whether he proposed to initiate legislation, applicable to Scotland, to provide for the regulation of such charities as made an appeal for public support on the lines of the Collecting Charities (Regulation) Bill now before Parliament, and which was applicable to England and Wales only.—Mr. ADAMSON replied: I am considering the question of initiating legislation for Scotland on the lines of the Collecting Charities (Regulation) Bill relating to England and Wales now before Parliament, but in the present state of Parliamentary business there would, I fear, be little prospect of finding time this session for any such legislation.

Health of the Mercantile Marine.

Lieut.-Colonel FREMANTLE asked the President of the Board of Trade if the committee set up by his predecessor a year ago to advise the Board of Trade and the Ministry of Health on matters affecting the health of the mercantile marine had yet reported; whether the report would be published; and what action had been, or would be, taken to improve the conditions affecting the health of the crews and passengers concerned.—Mr. W. GRAHAM replied: The committee to which the hon. Member refers was set up to consider and advise on any questions affecting the health of the mercantile marine which the Board of Trade or the Ministry of Health might from time to time refer to them. The committee's advice on the various questions referred to it is submitted to the departments as its consideration of each subject is completed and no general report is published. The subjects with which the committee has already dealt include the Ship Captain's Medical Guide, which has been revised and issued, the Scales of Medicines and Medical Instruments and Stores for ships which do not carry surgeons, which also have been revised and issued, and the preparation of a code for facilitating medical consultation at sea by wireless telegraphy. This has been completed and forwarded to the International Code of Signals Committee. The subjects at present under consideration include an investigation of the statistics relating to the mortality of seamen and the hygiene of crew spaces on board ship.

Criminal Lunatics in Scotland.

The Duchess of ATHOLL asked the Secretary for Scotland the total number of convicted prisoners, Borstal inmates, and criminal lunatics in Scotland for the last three years for which figures were available and the number and percentage of these who were natives of the Irish Free State.—Mr. ADAMSON replied: The following table gives the information desired for the years 1926, 1927, 1928, so far as available:—

A = Convicted prisoners. B = Borstal inmates.
C = Criminal lunatics.

Year.	Total of persons received into custody during the year.		Irish nationality. Number* and percentage.
1926	A	15,685	3566 (22·7)
	B	126	21 (16·6)
	C	17	4 (23·5)
1927	A	14,839	3298 (22·2)
	B	139	18 (12·9)
	C	24	3 (12·5)
1928	A	14,737	3063 (20·8)
	B	140	13 (9·2)
	C	18	3 (16·7)

* The figures include persons born in the Irish Free State and Northern Ireland, and also persons born elsewhere if the father is Irish. Separate figures for Irish Free State cases are not available.

Grants for Poor Relief and Lunacy.

Mr. HURD asked the Secretary to the Treasury, in respect of each of the last five years for which figures were available, what were the sums paid by the Treasury to the county of Wiltshire by way of grants in aid of local taxation, showing separately the payments for poor relief and mental hospitals, and other purposes; and, in respect of the same period, the gross sums paid on these accounts to the counties of Hampshire and Berkshire respectively.—Mr. GREENWOOD replied: The following statement shows the amount of Government grants (excluding grants for capital purposes) received by local authorities in the undermentioned administrative counties in the year ending March 31st, 1928, distinguishing the purposes for which the grants were paid. The grants shown include, in addition to voted monies, grants out of the local taxation account and out of the road fund.

Administrative county.	For poor-law relief (excluding pauper lunatics).	For lunacy and mental deficiency.	For police, housing, public health, and all other services.
	£	£	£
Berkshire	12,139	7,614	181,184
Southampton ..	21,091	21,286	324,884
Wiltshire	19,490	17,724	253,945

The corresponding figures for earlier years are not readily available.

PAY-BEDS AT NEWCASTLE.—The governors of the Royal Victoria Infirmary, Newcastle-on-Tyne, have decided to utilise the three main pavilions in the Orthopædic Hospital for pay-beds. The decision is to a certain extent a consequence of the financial situation of the infirmary, the expenditure of the last ten months having exceeded the income by £11,416. The three pavilions will provide over 80 beds.

PROVINCIAL VOLUNTARY HOSPITALS IN 1928.—The tenth annual report of the Provincial Voluntary Hospitals of Great Britain for 1928 has just been issued by the Central Bureau of Hospital Information, with a preface by Mr. R. H. P. Orde, the director. The figures show that the in-patients had increased by 45,660 and the out-patients by 176,896. It is pointed out that, since each out-patient makes several attendances, these hospitals dealt with over 12,000,000 out-patients in the year. The total amount raised was £9,604,541, an increase of £900,473; the total expenditure on maintenance and development was £8,190,844 leaving a surplus of £1,413,697. The hospitals with a credit balance on their maintenance account numbered 598—78·79 per cent. The provincial voluntary hospitals pay about £100,000 a year in rates, and the assessments vary from zero to £20 per bed—there is no definite coördinated principle. The British Hospitals Association is taking such steps as lie in its power to have the matter considered by the proper authorities with a view to the removal of these anomalies.

Correspondence.

"*Audi alteram partem.*"

EMPHYSEMA TREATED BY MECHANOTHERAPY.

To the Editor of THE LANCET.

SIR,—While admitting that mechanical measures may be of considerable help in certain pulmonary affections, I have no great faith in their value in cases of hypertrophous emphysema. In particular I do not think it advisable to attempt to reduce the size of the chest in this condition, nor indeed possible to succeed in the attempt without injury to this patient. In her communication to THE LANCET last week Dr. Kellgren-Cyriax refers to a patient, aged 73, "with undoubted emphysema." His chest was "barrel-shaped with the usual kyphosis. The chest wall was immobile, percussion note hyper-resonant, and breath sounds barely audible." The patient was treated "entirely on mechanotherapeutic lines, using chiefly passive and active exercise designed to strengthen expiration and in general to diminish the volume of the chest . . . . Treatment on these lines daily for a fortnight resulted in increased elasticity of the thorax, diminution of the barrel-shape and kyphosis, the breath sounds became more audible." While congratulating Dr. Kellgren-Cyriax on the patient's improvement under treatment, may I suggest that the attempt to reduce the size of the chest in a case of this kind implies a misapprehension of its pathology? The fact is, the enlargement of the chest in chronic hypertrophous emphysema is compensatory, an attempt on the part of Nature to minimise the evils resulting from a morbid condition. Owing to progressive loss of pulmonary elasticity the mean size of the chest undergoes a progressive increase owing to hyperactivity of the inspiratory muscles. Ultimately the barrel-shaped chest with kyphosis is produced in which the pulmonary capacity is greater than that which could be produced normally by the fullest possible inspiration. This process involves a fixation of the chest in the expanded position, the fixation being effected by a shortening of the chronically over-acting costal elevators (similar to the shortening which occurs in the muscles of the calf in talipes equinus), and by alterations in the costal joints and in the curves of the ribs. The enlarging thorax leads to a progressive tightening up of the elastic tissue in the alveolar walls which, owing to the loss of their elasticity, would otherwise become wrinkled, and thus encroach upon the alveolar cavities and in this way impede respiration. The fixation of the chest, while compensatory, is yet not an unmixed blessing, for while fixation saves the inspiratory muscles, it limits the expiratory movements and thus tends to render cough ineffective. We may be sure that the gain in the one case is greater than the loss in the other. While, during the advance of the disease, thoracic expansion progresses, costal breathing becomes correspondingly diminished and diaphragmatic breathing correspondingly increased; finally, costal breathing practically ceases and the breathing becomes entirely diaphragmatic, diaphragmatic expirations now being effected, not, as in normal subjects by elastic recoil only, but also by the vigorous contraction of the abdominal muscles.

These considerations lead me to conclude that, in estimating the effects of treatment on the dimensions and mobility of the patient's chest, Dr. Kellgren-Cyriax relied upon impressions rather than upon accurate measurement, since the enlargement of the chest in chronic emphysema is compensatory, the reduction of this man's chest even for a few minutes to the capacity proper to his early manhood would *inevitably lead to fatal asphyxia.*

I am, Sir, yours faithfully,

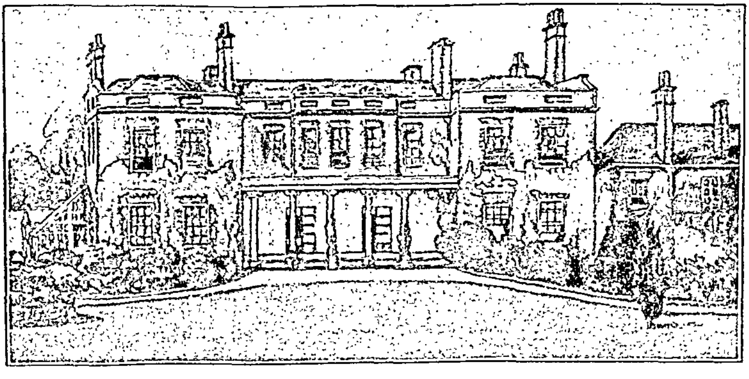
Harley-street, W., Dec. 28th, 1929. HARRY CAMPBELL.

UPTON HOUSE, PLAISTOW, THE BIRTHPLACE OF LORD LISTER.

To the Editor of THE LANCET.

SIR,—There are few now left who can remember Upton House, the birthplace of Lord Lister, as it was when his father, Joseph Jackson Lister, was living there. The main portion of the house still stands, shorn of some of its rooms and of the stables, and is the vicarage of St. Peter's, Upton Cross; faithfully are the associations with Lord Lister cherished by the vicar.

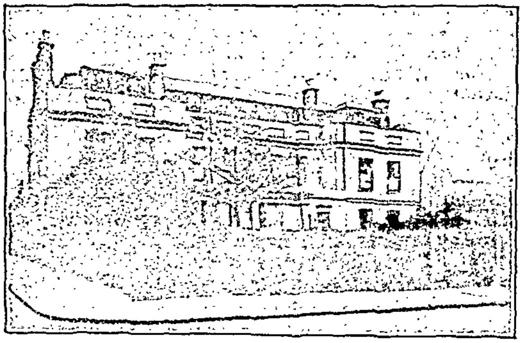
But the whole neighbourhood is completely changed, and what is now a densely populated London district was then hardly more than a country village. The beautiful garden at the back of the house has long been divided off and built over, but some of us remember the spacious lawn with its two great cedars, the kitchen garden beyond, the little summer-house, and the "terrace walk" with its broad holly hedge. It was over this hedge that the last wild red deer hunted from Hainault Forest bounded in 1828, and took refuge in the stable yard of Upton House. That was



Upton House as it was in Joseph Lister's childhood, after a drawing by Mary Lister. (From R. J. Godlee's "Lord Lister." Clarendon Press.)

when Joseph Lister was one year old. To the south of the garden was a meadow with scattered elms where cows grazed, and beyond were fields leading to the Thames Marshes.

There was a sense of peace about the old Georgian house and the grounds where the family of seven brothers and sisters spent their happy childhood. Besides the rooms usually occupied by the family there were attics where romps could take place undisturbed, and old lofts above the stables where tame owls and other pets were kept. Along the edge of the parapet the children would make their way round the roof, certainly without the knowledge of their elders. The study, with its French windows, seen under the colonnade to the left in the picture, was a sanctum where microscopic researches were carried on and grave converse held, and where children were only admitted by special permission.



Upton House as it now is. (From Handbook of Lister Centenary Exhibition at the Wellcome Historical Medical Museum.)

It was in the room above, the "Museum room," that in 1868 Joseph performed the operation of tying the carotid artery of a calf with a ligature made of catgut, the results of which proved the efficiency of seasoned catgut as a material for ligatures (see "Lord Lister" by Godlee, ed. 3, p. 229). The room with larger windows to the right was the old nursery, and behind it, facing Upton Lane, is the room where Joseph Lister was born in 1827, and where his father died in 1869. I am, Sir, yours faithfully,

Dec. 27th, 1929. G. LISTER.

*** An appeal for the preservation of the house which Miss Lister here describes has been issued over the signatures of the Bishops of Chelmsford and Barking, Lord Moynihan, and Sir James Slade, and with the support of Sir Humphry Rolleston, Sir William Lister, Sir StClair Thomson, and others. The house was purchased by the St. Albans diocesan authorities in 1885 and would have been sold by them on account of its dilapidated condition in 1918 had not the present vicar, the Rev. A. J. Parry, intervened and himself paid for the necessary structural repairs. A sum of £1800 it is stated would now capitalise the estimated annual dilapidations and preserve the house as the vicarage of the benefice. Should more money be subscribed the surplus would be used for setting up some memorial of Lister in the house itself. Cheques may be drawn in favour of "Lord Lister's Birthplace Preservation Fund," and sent to the hon. treasurers of the Fund at Upton House, Forest Gate, London, E.7.

Upton House, it may be recalled, is thus described in Dr. H. H. Bashford's "The Harley Street Calendar" (London: Constable and Co. 1929.), p. 209:—

> "Shorn of a wing and most of its garden, and the whole of the fields in which it stood, it is now the vicarage of an industrial parish, long since enveloped by the East of London. But at Lister's birth it was one of a little group of gracious and prosperous early eighteenth-century houses, surrounded by the farmlands of Thames-side, Essex, with the wild fowl nesting in Barking Marshes, and the panelled bedroom in which he was born looking westwards over Ham Park. This was the home—now an 'open space' carefully protected by Corporation railings—of his father's friend and fellow quaker, the Lombard-street banker, Samuel Gurney. And before the coming of the railway, when Lister was 12 years old—the fourth child in a family of seven—Mr. Lister and his neighbours, when the weather was fine, rode to their offices on horseback, or were collected by a coach, waiting at convenient points, and signalling its arrival by a horn."

—ED. L.

THE POSITION OF THE MEMBERS OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

To the Editor of THE LANCET.

SIR,—The position of the Members of the Royal College of Surgeons of England was set out clearly in your issue of Nov. 30th (p. 1149). A resolution advocating the representation of Members on the Council has now been passed by large majorities at 41 annual meetings of Fellows and Members. The reply of the Council to the resolution which was passed at the annual meeting of Nov. 21st last is given in your issue of Dec. 21st (p. 1341) when reporting the proceedings at the subsequent meeting of the Council of the College. In that reply the Council points out that no evidence is before them that any considerable number of Members desire a change in the constitution of the Corporation.

Now the only way to produce substantial evidence is to submit to the Council a widely signed request for consideration of a claim which everyone must admit to be just. A card of inquiry will accordingly shortly be issued to all Members and we trust that it will meet with a large response and that the position of the Members will be viewed broadly. At this stage the question of whether a Member is personally interested does not arise, for the whole body of Members are corporately interested in obtaining a recognition of their desire to be more intimately associated with the conduct of the College. Nor at this stage do any questions arise as to what measure of representation should be accorded and the machinery for securing it. All that is needed is an adequately large expression of the view that the desired modification in the constitution of the College should be brought about. We feel that the honour of the College is in question, and we confidently hope that this large view will be taken.

Financial help will be required to meet the expenses of the movement. We estimate that the sum of £250 will be needed and I shall be glad to receive subscriptions towards that total.

I am, Sir, yours faithfully,
ERNEST E. WARE,
President of the Society of Members, R.C.S.

60, Welbeck-street, London, W., Dec. 28th, 1929.

MUTILATING OPERATIONS.

To the Editor of THE LANCET.

SIR,—In your last issue Dr. F. G. Crookshank has written an interesting letter on mutilating operations from the psychological point of view. May I add some remarks from the surgical standpoint?

I am entirely in agreement with Dr. Crookshank's protest against the performance of unnecessary circumcisions. I have believed for many years that the word "phimosis" is much abused, and that only a small proportion of the circumcisions that are performed are surgically justified. I doubt whether adequate instruction is usually given to students on the subject; and I think that too often, at any rate in hospital practice, a ready-made diagnosis of phimosis is accepted without due consideration. Nearly always in the babies seen at hospital the mother complains that the baby screams when he passes his water or appears to strain. Sometimes this is due to acidity of the urine, and usually on examination the foreskin is found not to be narrow, but merely to have the normal adhesions to the glans;

at the worst a somewhat narrow preputial orifice can be rendered normal by a single stretching after the adhesions have been separated. Apart from psychological considerations against the performing of unnecessary circumcisions, the operation when performed upon babies in out-patient departments, as is usually done, is attended with serious dangers, and lives may occasionally be lost from post-operative hæmorrhage or sepsis. I have found in private practice that the simple operation of freeing adhesions and stretching the prepuce when necessary proves perfectly satisfactory, and is greatly preferred by most parents when the facts have been explained to them. I believe that the other arguments brought forward by Dr. Crookshank are of great importance, and that the operation of circumcision, when it has no ritual *significance*, should seldom be performed.

I am, Sir, yours faithfully,

GEOFFREY KEYNES.

Park-square West, Dec. 27th, 1929.

To the Editor of THE LANCET.

SIR,—I quake at my temerity in almost opposing Dr. F. G. Crookshank, but I think that some rather obvious data have been overlooked by him. Of course, quite unitalicised physicians and surgeons and laymen had already noticed neuroses and psychoses—though they may not have so labelled it—following on "unprovoked and unwarrantable trauma"; and with a sexual basis when the trauma had been genital. Moreover, male patients have been known who worried gravely over a relative inferiority in size of penis. The few of these who have consulted me were uncircumcised. Dr. Jago thought the cause of the Swahili's comparative ineptitude lay in the psychic changes induced by the physical trauma of circumcision in boyhood. Not very far off, however, were the Masai—circumcised before manhood. His white ruler and trembling black neighbours would not think it profitable to look for penile "organ inferiority" psychoses in the Masai. Age-long experience of Armenians, and Balkan Rayahs, of both sexes, did not disclose to them any sort of sense of any organ inferiority in the Ottoman Turk—circumcised in boyhood. We all, too, know of the vigorous tribes who cloud the north-west frontier of India. They are circumcised in boyhood; they have gained, nevertheless, a sense of humour. What a pity, then, that we shall not hear them on the sense of organ inferiority acquired by circumcision! Dr. Crookshank, however, has not made it clear enough whether he would consider all or any of these circumcised to have been subjected to "unprovoked and unwarrantable trauma." There is some slight suggestion in his letter that circumcision after infancy could be performed skilfully enough to keep outside his category of trauma unprovoked and unwarrantable.

There are the many, alive and for study, whose religion has enjoined circumcision in infancy. Outsiders have not yet noticed in them an undue proportion of sufferers from the sense of organ inferiority. And ready to Dr. Crookshank's hand are the Hebrew scriptures—surely extensive enough and naive enough material in which to look for signs of the sense of penile "organ inferiority."

Yet here again Dr. Crookshank is rather baffling; for with him circumcision in infancy seems to be "to strip a baby boy's penis." So it may be after all only a matter of operative technique and a too eager thoroughness. Metchnikoff—it is true of the school of Pasteur, Lister, and Koch, rather than of Freud, Jung, and Adler—saw in the prepuce and the hymen but evolutionary developmental faults, functioning no more than as obstacles to love. Sir Arthur Keith, of the school of Hunter, while agreeing as to the faults in development, cheered us all up by pointing out that love thrived on obstacles—perhaps a distinct approach to Dr. Crookshank's position.

I am, Sir, yours faithfully,

H. M. HANSCHELL.

Weymouth-street, London, W., Dec. 31st, 1929.

TREATMENT OF DRUG ADDICTS IN NEW YORK CITY.

To the Editor of THE LANCET.

SIR,—I read, with great interest, in your last issue the report of the Committee appointed in New York to investigate various methods of treatment for drug addiction. The experiments were carried out on a large scale, 100 patients being treated by each method tested. Narcosan, a much vaunted "specific," appeared to make symptoms worse and proved to be no specific. Treatment with various substitutes failed to relieve the patients and sudden and knock-out methods caused much suffering.

The gradual reduction method, attending to each symptom as it arose, involved the least suffering and proved to be the safest. This is the method I have always advocated, and I have employed it at Bay Mount for many years with success. In the hands of an experienced physician it can be administered in such a way that the patient does not suffer at all and experiences very little discomfort. In fact, patients are usually unaware when the drug is finally withdrawn.

If addicts could only realise that they can be treated without suffering they would present themselves more readily for treatment.

I am, Sir, yours faithfully,

STANFORD PARK, M.B., Ch.B.,
Resident Medical Superintendent, Bay Mount,
Paignton, S. Devon.

Dec. 28th, 1929.

COMPLICATIONS OF OPERATIONS FOR PILES.

To the Editor of THE LANCET.

SIR,—A perusal of the report of the meeting of the Proctological Section of the Royal Society of Medicine on the above subject in your last issue (p. 1360) makes me wonder more than ever why any surgeon nowadays recommends operations for cases of internal hæmorrhoids. For the past 15 years I and a few others in England, and a host of surgeons in America, have been pointing out that *every* case of uncomplicated internal hæmorrhoids can be cured with certainty and complete safety by means of injections—i.e., by a purely ambulatory treatment. This was true even before the high submucous injection of 5 per cent. phenol in vegetable oil had been described by me in 1928[1]—I believe for the first time in England; but it can now be added that by this method there is a complete absence of all serious complications, and that even pain is quite exceptional, whilst recurrences are at least as few as after operations of the old sort.

When one reads an appalling list of complications, like those mentioned at the meeting referred to above, one cannot help feeling that the discussion might almost have been designed as a text for the *advocates of the treatment by injection.* Every speaker at the meeting dwelt upon the impossibility of consistently avoiding the occurrence of very severe pain after operation, and there was considerable diversity of opinion as to the choice of method of operation with a view, firstly, to limiting the amount of pain; and, secondly, to limiting the incidence of cases of dangerous primary and secondary hæmorrhage and of severe stricture following operation. Mr. Milligan placed the incidence of the last of these as high as between 9·2 and 11·3 per cent.! Mr. Cecil Rowntree put the matter excellently when he said that "the patient who exchanged his piles for a stricture was reminded every day of his life what a bad bargain he had made." The same speaker referred to a fatality he had seen from intestinal obstruction following an operation for piles, whilst Mr. Norbury said that he had had two cases of suppurative pylephlebitis, one of which proved fatal. If experts like these have to admit such catastrophes and serious complications after their operations, one shivers to think what the mortality and morbidity-rates must be where less skilled operators are concerned.

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[1] THE LANCET, 1928, i., 543.

Mr. W. B. Gabriel was the only surgeon at the meeting who so much as referred to the treatment by means of injection, and even he does not seem to have been very emphatic on his preference for that method. A possible explanation for his lukewarmness may be found on p. 1367 of the same issue, where he describes a syringe he has devised for "the high submucous injection of 5 per cent. phenol in vegetable oil as described by Albright and Blanchard." As his syringe holds only 3 c.cm. of oil, and as his needle is only 3¾ inches in length, it is evident that he has not grasped the essentials of Albright and Blanchard's method, because those American proctologists have laid stress upon the necessity of injecting very large amounts (from 2 to even 10 c.cm. into each puncture) and of going as high as there is any loose mucous membrane—if necessary even above the valves of Houston. The syringe described by Mr. Gabriel does not hold enough for even one injection and would not ever reach high enough—Blanchard at times uses a needle on a shaft some 7 inches long. Nevertheless, I welcome Mr. Gabriel as a convert to the treatment of internal hæmorrhoids by injection, even in cases of "bad piles." Mr. Gabriel wrote an invaluable article on the treatment of pruritus and of fissure by means of injection of anæsthesin in oil ("A.B.A.")[2] for which I have cause to be exceedingly grateful, because by his method I have now treated a large number of fissure cases without operation or general anæsthetics, and invariably with instant relief and—so far at any rate—without a single recurrence or mishap. This has made it possible to treat by injection even cases of internal hæmorrhoids complicated by fissure—cases which previously I should have dealt with by a preliminary divulsion of the sphincters under general anæsthesia.

Where so much can be done for rectal cases by "ambulant" methods it seems a thousand pities that the majority of rectal surgeons still continue to perform operations of the old sort, even though they admit the frequency and variety of severe complications and even occasional fatalities that they incur thereby.—I am, Sir, yours faithfully,

ARTHUR S. MORLEY.

Upper Wimpole-street, W., Dec. 28th, 1929.

THE BRUIT D'AIRAIN.

To the Editor of THE LANCET.

SIR,—Is it quite correct to say that the bruit d'airain was *first* described in April, 1857, and to suggest that it was not known to Laennec? (I am writing with allusion to the excellent paper by Drs. McLaughlin and Dix-Perkin in the last issue of THE LANCET.)

On reference to Gee's "Auscultation and Percussion"—that wonderful little book which constitutes an inexhaustible mine of information—I find it stated, on page 131, that the bell sound or metallic ring *was* well known to Laennec. Dr. Gee wrote, as do Drs. McLaughlin and Dix-Perkin, that coins are not necessary for the eliciting of this sound, and admitted that there is no reason for thinking that Laennec percussed with coins. But he cited the following passage from the "Traité de l'Auscultation médiate (i., 111, 696), which seems pretty conclusive:—

> "En auscultant à l'aide du stéthoscope, et percutant en même temps, on entend une résonnance semblable à celle d'un tonneau vide, et mêlée par moment de tintement."

On the other hand, Gee unhesitatingly accredits Trousseau with having given the name of bruit d'airain to the metallic sound heard, on auscultatory percussion, over a pneumothorax, sometimes at any rate, and irrespectively of the use of coins.

The authors of the paper in question have done such good work in helping us to get away from the notion that the metallic bell sound has any necessary connexion with the use of coins that I hope they will forgive me, not only for having raised the point that I have, but for making two more. (1) *Airain* is not translated by brass, but by *bronze*. Frenchmen always speak of what we call brass as *cuivre jaune*. (2) *Laennec* should be spelt always thus, as I have spelt it, without either vowel-ligature or diæresis, just as are the place names, Caen, Laon, &c.

I am, Sir, yours faithfully,

Dec. 28th, 1929. ANGLO-GALLICUS.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Rear-Admiral D. W. Hewitt is placed on the retd. list at his own request.

Surg. Capt. R. W. B. Hall to be Surg. Rear-Admiral.

W. M. Greer and J. G. Lynch to be Surg. Lts.

The following appointments are notified: Surg. Lt.-Comdr. (D.) C. Williams to *Pembroke* for R.N. Barracks, Chatham, and Surg. Lt. J. B. W. Rowe to *Peterel*.

ROYAL ARMY MEDICAL CORPS.

Col. G. G. Delap, late R.A.M.C., retires on retd. pay.

Lt.-Col. J. M. H. Conway, having attained the age for compulsory retirement, is placed on retd. pay.

Lt.-Col. W. P. MacArthur is granted the temporary rank of Col. while employed as Consulting Physician to the British Army.

Maj. L. C. Hayes retires on retd. pay and is re-employed.

Maj. B. L. Davis is placed on the half-pay list on account of ill-health.

ARMY DENTAL CORPS.

Capt. W. A. Rankin to be Maj.

MILITIA.

Maj. R. T. C. Robertson retires on attaining the age-limit and is granted the rank of Lt.-Col.

TERRITORIAL ARMY.

Capt. J. H. Iles, having attained the age-limit, relinquishes his commn. and retains his rank.

Lts. W. L. Kinnear, J. Carver, and C. D. Bruce to be Capts.

Second Lt. E. T. Colville (late R.G.A., Spec. Res.) to be Lt.

Supernumerary for Service with O.T.C.: Second Lt. W. P. Kennedy, from Gen. List, T.A., to be Lt., supern. for serv. with Med. Unit, Edinburgh Univ. Contgt., Sen. Div. O.T.C.

ROYAL AIR FORCE.

Flight Lt. G. Kinneir relinquishes his commn. on completion of service.

INDIAN MEDICAL SERVICE.

Capt. J. G. McCann to be Maj.

Lts. J. F. O. Bodman and B. N. Hajra to be Capts. (prov.).

Lt.-Col. W. G. Hamilton retires.

Fateh Mohammad Khan, Bishan Singh, and Madan Gopal Saincher to be Temp. Lts.

Temp. Capt. H. K. Datta, who has relinquished his temp. commn., is permitted to retain the rank of Capt.

The undermentioned officers relinquish their temp. commns.: Capt. C. Joshi and Lts. P. Singh, G. S. Malik, R. Lal, and K. T. Hosain.

REBUILDING OF PARIS FACULTY OF MEDICINE.—The Rockefeller Foundation has offered £1,200,000 towards rebuilding the medical school of the University of Paris. This school was built in 1877 to accommodate 1000 students, but now holds 5000. "It is well known," writes our Paris correspondent, "that the Faculty of Medicine, if rich in professors, has a dwelling only worth what the stones would fetch if it were knocked down. Many attempts have been made by Prof. Roger, dean since the war, to stir up the public authorities, and obtain the necessary money. But hitherto no success has been attained; the money did not seem ready to come. Now the Rockefeller Committee offers 6,000,000 dollars for the purpose, but only under certain conditions. Thus the new Faculty must be a whole block and must be built on a site near the present one and the Latin quarter. Such a site exists, but is at present occupied by the wholesale wine market. This, however, could be moved. The French Government will have to give an equal sum before the Rockefeller grant is made, but the general feeling of the press here is that this should be done so as not to miss the chance of making the Paris Faculty the finest in the world."

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[2] Brit. Med. Jour., 1929, i., 1070.

Obituary.

COLL REGINALD MACDONALD, M.D. ABERD., D.P.H.

Dr. Coll Macdonald died in London, as the result of a street accident, on Christmas Eve, 1929, at the age of 77. He was a graduate of Aberdeen, and after a period of general practice in Ayrshire became county and district medical officer there in 1891. He was thus one of the first group of whole-time county medical officers in Scotland of whom there were 16 in all. Of these two are still in office, ten are dead, two are retired, and two transferred early to other appointments, one being still in active work. These appointments were all made under the powers of the Local Government (Scotland) Act, 1889. As an encouragement to the appointment of whole-time men, the Government of the day gave a grant of ten shillings in the pound for salaries and approved outlays. The majority of the counties decided in favour of whole-time men, and the county of Ayr, a large county with manufactures, mining, iron, shipping, and agriculture, went with the majority. Macdonald's main work in the early days was the promoting of hospital accommodation for infectious diseases. The large mining population demanded a great deal of sanitary supervision, and Macdonald was one of the five county medical officers asked by the Local Government Board for Scotland to make a report on the housing of miners as a preliminary to the later survey by the Royal Commission on housing. When the later developments supervened—medical inspection of schools, tuberculosis, child welfare, venereal disease, maternity service—Macdonald became head of the school health service, and took his full part in establishing this and the other sections of health work. The county and burgh authorities combined to take over the new sanatorium at Glenafton. They combined on a large scale also for child welfare, maternity, and venereal diseases, and in these four or five sections Ayr is one of the best organised counties in Scotland. By 1926, when he retired, Macdonald had a considerable staff under him for each of these main divisions of work. In the 35 years a soundly compacted county system of public health administration and school health administration had come into existence, and the new Local Government Act has had the way well prepared for it.

In person Dr. Macdonald was genial yet reserved. He was never wanting in appreciation of the work of his colleagues, and his own reports were sound and well proportioned. "His many friends will miss his sensitive conversation and his kindly smile," writes one who knew him personally.

THOMAS EVANS FRANCIS, O.B.E., M.D. LOND.

WE have to record the death at Colombo of Dr. T. E. Francis, at the early age of 47. Dr. Francis was last year obliged by ill-health to resign the post of medical officer of health for Barnsley, and his death occurred during a first voyage as ship surgeon. Born at Blackwood, in Monmouthshire, he was the son of George Gifford Francis and was educated at Pengam School and University College, Cardiff. From there he went to St. Mary's Hospital with an entrance Scholarship, subsequently studying also at St. Bartholomew's, and in 1905 he graduated as M.B. Lond. After a period as resident medical officer at Hampstead General Hospital he proceeded to the M.D. degree in State medicine and took up an appointment as assistant school medical officer for Glamorgan. In 1911 he became medical officer of health and school medical officer for Llanelly, but he left this work from 1914 to 1918 and served as a surgeon in the Royal Navy, being attached to *Britannia*, to the hospital ship *Soudan* and to the Haslar and Plymouth Hospitals. In 1920 he left Llanelly to fill the vacant post at Barnsley.

Dr. Francis married Beatrice, daughter of Edward Fisher, and his widow survives him with three children. His eldest son is studying medicine at St. Bartholomew's Hospital.

IN the obituary notice of Dr. Scott Riddell in our issue of Dec. 14th last Dr. Riddell's rank in the Order of the British Empire was wrongly stated. It should have been given as Commander.

Medical News.

UNIVERSITY OF CAMBRIDGE.—On Dec. 19th the following degrees were conferred:—

M.Chir.—F. J. Milward.
M.B. & B.Chir.—L. J. Rae.
M.B.—L. R. Janes and C. G. Townsend.

UNIVERSITY OF LONDON.—At recent examinations the following were successful:—

M.D.

Branch I. (Medicine).—Benjamin Barling, Univ. Coll. Hosp.; F. M. M. Eyton-Jones, St. Bart.'s. Hosp.; C. F. Fernando, Univ. Coll. Hosp.; T. R. Hill, Guy's Hosp.; B. B. Hosford, St. Bart.'s Hosp.; R. M. Maher, Univ. of Liverpool; H. L. Marriott, Middlesex Hosp.; R. L. Midgley and N. D. Patel, Univ. Coll. Hosp.; W. M. Ramsden, Guy's Hosp.; B. F. Russell and E. W. Skipper, London Hosp.; and E. C. Warner, Guy's Hosp.
Branch II. (Pathology.)—G. W. J. Bousfield, St. Thomas's Hosp.; Beatrice D. Pullinger and Dorothy M. Vaux, L.S.M.W.
Branch IV. (Midwifery and Diseases of Women.)—Janet I. Hoare, Winifred A. Ladds, and Edna I. Langston, L.S.M.W.; and Isabella L. H. Livingstone, King's Coll. Hosp.
Branch V. (State Medicine.)—G. L. Brocklehurst, St. Bart.'s Hosp.; and S. C. Gawne, Univ. of Liverpool.

M.S.

Branch I. (Surgery).—A. W. Holgate, Univ. Coll. Hosp.; and N. P. L. Lumb and R. W. Reid, St. Thomas's Hosp.
Branch III. (Ophthalmology.)—J. W. T. Thomas, Univ. Coll., Cardiff and Middlesex Hosp.
L.S.M.W. = London (Royal Free Hosp.) School of Medicine for Women.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates passed in the undermentioned subjects:—

Surgery.—J. S. Bury, Manchester; D. Ram Annamalai, London Hosp.; B. T. Squires, Guy's Hosp.; and C. D. Trimble, Birmingham.
Medicine.—C. W. Ellison, St. Bart.'s. Hosp.; V. J. Lopez, St. Mary's Hosp.; L. J. Pearson, Birmingham; T. G. Robinson and B. T. Squires, Guy's Hosp.
Forensic Medicine.—C. E. P. Davies and W. J. D'Rosario, Guy's Hosp.; R. J. Kagan, St. Mary's Hosp.; V. J. Lopez, Guy's Hosp.; D. Ram Annamalai, London Hosp.; and B. T. Squires, Guy's Hosp.
Midwifery.—T. Chandrasekharan, Madras; G. P. Charles, Sydney and Westminster Hosp.; W. J. Frith, London Hosp.; R. J. Kagan, St. Mary's Hosp.; I. W. H. Mansfield, Middlesex Hosp.; P. Somasunder, London Hosp.; L. J. P. Soromenho, Lisbon and St. Bart.'s. Hosp.; B. T. Squires, Guy's Hosp.; and C. D. Trimble, Birmingham.

The Diploma of the Society entitling them to practise medicine, surgery, and midwifery was granted to W. J. Frith, R. J. Kagan, V. J. Lopez, and B. T. Squires.

UNIVERSITY OF DURHAM.—On Dec. 21st the following degrees were conferred:—

M.D. (Practitioners of 15 Years' Standing.)—V. A. Goonetilleke and H. M. S. Turner.
M.B., B.S.—Abe Franklin, S. M. Garstein, C. M. Gillis, and J. L. Wolfe.

UNIVERSITY OF LIVERPOOL.—The late Prof. E. E. Glynn, formerly professor of pathology in the University, left £1000 for the department of pathology.

POST-GRADUATE COURSES IN NEUROLOGY.—A post-graduate course on Diseases of the Nervous System will be held at the National Hospital, Queen-square, London, W.C., from Feb. 3rd to March 28th. It will include 32 clinical lectures and demonstrations at 3.30 P.M. on each week-day except Wednesday and Saturday. There will be teaching in the out-patient department in the afternoons, and pathological demonstrations on Mondays at noon. Two other courses—on the Anatomy and Physiology of the Nervous System, and on Methods of Examination—will be given at noon on Fridays and at noon on Tuesdays and Thursdays. Particulars may be had from the secretary of the medical school at the hospital.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—At a meeting at 17, Bloomsbury-square, London, W.C. 1, on Tuesday, Jan. 14th, at 8.30 P.M., the Harrison Lectureship Medal will be presented to Mr. P. A. W. Self, who will deliver the Harrison Memorial Lecture upon Research. The Lectureship was established in memory of Colonel Edward Frank Harrison, Director of Chemical Warfare during the late war.

ROYAL INSTITUTE OF PUBLIC HEALTH.—The next congress of this institute will be held in Portsmouth during Whitsuntide, 1930, from Wednesday, June 4th, to Monday the 9th. The scientific work will be conducted in five sections: State medicine and municipal hygiene; naval, military and air (including tropical diseases); industrial hygiene; women and children and the public health; and tuberculosis. Further details may be had from the hon. secretaries at 37, Russell-square, London, W.C., 1.

RADIOLOGY AND TUBERCULOSIS.—The Joint Tuberculosis Council have arranged a post-graduate course to be held in the X ray department of the Hospital for Consumption and Diseases of the Chest, Brompton, London, S.W., from Monday, Jan. 27th, to Saturday, Feb. 2nd. It will be conducted by Dr. Stanley Melville, assisted by members of the hospital staff, and the class will be limited to 25 members who will form small groups. Further information may be had from Dr. William Brand, secretary of the Council, at Tavistock House North, Tavistock-square, London, W.C. 1.

UNIVERSITY OF BRISTOL.—Dr. R. J. Brocklehurst has been appointed to the chair of physiology in the University as from August 1st of this year.

A medical graduate of Oxford, where he took a first-class in the honours schools, Dr. Brocklehurst worked as assistant in physiology, first part-time, then whole-time, at St. Bartholomew's Medical College from 1925 to 1926. He was then awarded a Radcliffe Travelling Fellowship, with which he went to America and Germany. In August, 1928, he returned to take up the post of senior lecturer in physiology at University College.

DANGEROUS DRUGS REGULATIONS.—In pursuance of the Dangerous Drugs (Consolidation) Regulations, 1928, the Home Secretary has appointed two dental tribunals—one for England and Wales and one for Scotland—to which as occasion arises may be referred for examination and consideration any case in which there is, in his opinion, reason to think that a dentist may be administering any of the drugs to which the regulations apply, either to himself or to any other person otherwise than as required for purposes of dental treatment. The appointment of the tribunal is an extension to dentists of the system already adopted with regard to medical practitioners on the recommendation of the Departmental Committee on Morphine and Heroin Addiction in their report issued in January, 1926. The membership is as follows: England and Wales: Mr. W. H. Dolamore (chairman), nominated by the Dental Board of the United Kingdom; Mr. E. C. Sprawson, nominated by the General Medical Council; and Mr. N. G. Bennett, nominated by the British Dental Association, or Mr. F. Butterfield, nominated by the Incorporated Dental Association, with Mr. E. Percival Clarke, K.C., as Legal Assessor. Scotland: Mr. W. Guy (chairman), nominated by the Dental Board of the United Kingdom; Mr. J. H. Gibbs, nominated by the General Medical Council; and Mr. W. Graham Campbell, nominated by the British Dental Association or Mr. G. Hogg Patterson, nominated by the Incorporated Dental Association, with Mr. John Cowan, K.C., as Legal Assessor.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Jan. 7th.—8 P.M., TROPICAL DISEASES: PATHOLOGY. Special discussion on Tropical Diseases Arising from Dietetic Deficiency. Openers: Prof. J. W. B. Megaw (Tropical), Dr. G. Marshall Findlay (Pathology).

THURSDAY.—7.45 P.M., NEUROLOGY. Clinical Meeting at the West End Hospital for Nervous Diseases, Welbeck-street, W.

FRIDAY.—8.30 P.M., OPHTHALMOLOGY (Cases at 8 P.M.). Demonstration: Mr. F. W. Edridge-Green (introduced by Mr. Doyne): The Influence of the Parafoveal on the Foveal Region of the Retina. Papers: Mr. J. D. N. Cardell: Krukenberg's Spindles. Mr. E. Wolff: A Microphthalmic Family. Cases and Specimens: Mr. A. F. MacCallan: (1) Copper Wire in Eye—Specimen of Enucleated Eye. (2) Melanotic Sarcoma of Choroid. Other cases will be shown.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Jan. 6th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases. Clinics. Operations.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

MONDAY, Jan. 6th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Sinclair: Surgical Wards.

TUESDAY.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Mr. Hamblen Thomas: Throat, Nose, and Ear Dept. 2.30 P.M., Sir Henry Simson: Gynæcological Operations.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards. Dr. Scott Pinchin: Medical Out-patients.

THURSDAY.—11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Department. 2 P.M., Mr. MacDonald: Genito-Urinary Department.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Department. 2 P.M., Mr. Sinclair: Operations.

SATURDAY.—9 A.M., Mr. Vlasto: Throat, Nose, and Ear Operations. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Children's Department.

Daily, 10 A.M. to 5 P.M., Medical, Surgical and Special Out-patients, Operations, Ward Visits, Anæsthetic Courses.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Jan. 7th.—3.15 P.M., Dr. Rubens Wade: Anæsthesia.

EAST LONDON HOSPITAL FOR CHILDREN, Shadwell, E.

WEDNESDAY, Jan. 8th.—4.15 P.M., Clinical evening. Cases of interest will be demonstrated in the wards. Tea at 4 o'clock.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

THURSDAY, Jan. 9th.—5 P.M., Dr. W. N. Goldsmith: Lichen Planus.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL

FRIDAY, Jan. 10th.—4 P.M., Mr. N. Rankin: Ear-ache.

ST. MARY'S HOSPITALS, Manchester.

FRIDAY, Jan. 10th.—4.30 P.M. Post-graduate Lecture (at the Whitworth-street West Branch), Dr. W. Fletcher Shaw: Albuminuria and Eclampsia.

Appointments.

BARKER, M., L.R.C.P. Lond., M.R.C.S., D.P.H., has been appointed Deputy Medical Officer for East Ham.

BLANDY, M. A., M.B., B.S. Lond., M.R.C.P. Lond., Assistant Medical Officer, the Royal College of St. Katharine, Poplar Infant Welfare Centre.

GRIFFIN, A. J. B., M.B., B.Ch. Liverp., D.P.H., Medical Officer of Health for Worcester.

HUGHES, E. R., L.R.C.P. Lond., M.R.C.S., Medical Officer of Health for Holyhead.

POPPER, O., F.R.C.S., M.B., Ch.B. Edin., Surgeon in Charge of Ear, Nose, and Throat Department, Queen's Hospital for Children.

SPENCE, D. L., M.B., B.Ch'r. Camb., Medical Officer to the Post Office at Melksham Suboffice.

Glasgow Royal Maternity Hospital: M'CASH, MARGARET S. L., M.B., Ch.B. Glasg., and WILSON, ELIZABETH R. M., M.B., Ch.B. Glasg., House Surgeons; DOUGLAS, N., M.B., Ch.B. Glasg., and OSWALD, FRIEDA, J., M.B., Ch.B. Glasg., Outdoor House Surgeons.

Certifying Surgeons under the Factory and Workshop Acts: HASKINS, L.W. R., M.B., B.Ch. Dub. (Wadebridge, Cornwall); TURNER, J. W., L.R.C.P. Lond., M.R.C.S., (Berkhamsted); and WHITEHEAD, E. C., M.B. Lond., L.R.C.P. Lond., M.R.C.S. (Kings Cliffe, Northampton).

Vacancies.

For further information refer to the advertisement columns.

Acton Hospital, W.—Res. M.O. £150.

Bethnal Green Hospital, E.—Sen. Asst. M.O. £500.

Birmingham, Dudley-road Hospital.—Gynæcologist and Obstetrician. £700.

Birmingham City.—M.O. for Maternity and Child Welfare. £600.

Birmingham City Mental Hospital.—Jun. Asst. M.O. £350.

Birmingham, Selly Oak Hospital.—Two Cas. O.'s. Each at rate of £200.

Blackburn and East Lancashire Royal Infirmary.—Res. H.P. £150.

Bloomsbury Dispensary, 12, Bloomsbury-street, W.C.—Res. M.O. £250.

Bradford Royal Infirmary.—Res. Surg. O. £250.

Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.

Burnley, Victoria Hospital.—H.S. At rate of £125.

Cambridge, Papworth Village Settlement.—Second Asst. M.O. £350. Also H.P. At rate of £100.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Hon. First Asst. in Out-patient Dept. Also Third Res. H.S. At rate of £75.

City of London Hospital for Diseases of Heart, &c., Victoria Park, E.—Anæsthetist.

Croydon General Hospital.—Hon. Gynæcologist and Hon. M.O.

Dreadnought Hospital, Greenwich.—H.P. and H.S. Each £110.

Great Yarmouth General Hospital.—Asst. M.O. to Ear, Nose, and Throat Dept.

Harrogate Infirmary.—Jun. H.S. At rate of £100.

Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. £50.

Hospital for Sick Children, Great Ormond-street, W.C.—Part-time Jun. Cas. O. At rate of £150. Also Clin. Asst. M.O. for Venereal Dept. £1 1s. per session.

Huddersfield Royal Infirmary.—Jun. H.S. for Eye, Ear, Nose, and Throat Dept. At rate of £150.

Hull Royal Infirmary.—Third H.S. Also Asst. H.P. At rate of £150 and £130 respectively.

Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £150. Also first H.S. At rate of £120.

Leamington Spa, Warneford General Hospital.—Res. H.P. £165.

Leeds Jewish Herzl-Moser Hospital.—Res. M.O. £100.

Leicester Royal Infirmary.—Hon. Phys. and Hon. Surg.

Leigh Infirmary, Lancashire.—Res. H.S. At rate of £150.

Liverpool, Royal Southern Hospital.—Two H.P.'s. Three H.S.'s., and M.O. Each at rate of £60. Also Res. Cas. O. At rate of £100.

London County Council.—8th Asst. M.O. £300. Also Temporary Asst. M.O. 30s. per session.

London Female Lock Hospital, 283, Harrow-road, W.—H.S. At rate of £150. Also Hon. Obstet. Surg.

Manchester, Babies' Hospital, Burnage-lane, Levenshulme.—Sen. Res. M.O. At rate of £125.

Manchester Royal Infirmary.—Five H.S.'s. H.S. to Aural, &c. Four H.P.'s. All at rate of £50. Also Asst. M.O. and Clinical Asst. in Aural Out-patient Dept. Each £35.

Manchester, St. Mary's Hospitals.—Four H.S.'s. Each at rate of £50.

Manchester University.—Lecturer in Dental Histology. £50.

Metropolitan Asylums Board.—Jun. Asst. M.O. £500.

Mile End Hospital, Bancroft-road, Mile End, E.—Res. Deputy Med. Supt. £600.

Newark Hospital and Dispensary.—Res. H.S. At rate of £150.

Norwich City.—Asst. M.O.H. &c. £450.

Redruth, Cornwall, West Cornwall Miners' and Women's Hospital.—Res. M.O. £200.

Rochdale Infirmary and Dispensary.—Jun. H.S. £175.

Royal Army Medical Corps.—Commissions.

Royal Dental Hospital, Leicester-square, W.C.—Lecturer on Anæsthetics and Bacteriology.

Royal London Ophthalmic Hospital, City-road, E.C.—Out-patient Officer. £100.

St. John's Hospital, Lewisham, S.E.—Orthopædic Surg. Also Cas. O. At rate of £100.

Salford Royal Hospital.—H.S. At rate of £125.

Sheffield, Jessop Hospital for Women.—Two Asst. H.S.'s. Each at rate of £100.

Sheffield, Winter-street, Hospital.—Asst. Tuber. O. £450.

Southwark Metropolitan Borough, S.E.—Asst. M.O.H. £600.

Stafford, Staffordshire General Infirmary.—H.P. At rate of £150.

Stroud General Hospital, Glos.—H.S. At rate of £125.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Sen. Res. M.O. At rate of £250. H.P. and H.S. Each at rate of £100. Also Out-patient Anæsthetist. 10s. 6d. per attendance.

West End Hospital for Nervous Diseases, Regent's Park, N.W.—Jun. H.P. At rate of £100.

West London Hospital, Hammersmith-road, W.—Asst. Dental. S. Also Two Hon. Anæsthetists.

Willesden General Hospital, N.W.—Res. H.S. At rate of £100.

Winchester, Royal Hampshire County Hospital.—Sen. Res. M.O. £200.

Wrexham and East Denbighshire War Memorial Hospital.—Two Res. H.S's. Each at rate of £150.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Faversham.

Births, Marriages, and Deaths.

BIRTHS.

THOMAS.—On Nov. 29th, 1929, at "San Remo," Belfast, to Elizabeth S. Thomas, M.B., B.Ch., D.T.H., wife of Captain A. F. F. Thomas—a daughter.

WILLCOCKS.—On Christmas Day, 1929, at Springfield, Chelmsford, the wife of Dr. R. W. Willcocks, of a daughter.

DEATHS.

DAVIS.—On Dec. 24th, 1929, suddenly, of pneumonia, at a nursing home in Eastbourne, Thomas Richard Earls Davis, M.B., Ch.M. (Sydney).

DUKE.—On Dec. 23rd, 1929, at Hyde-gardens, Eastbourne, Benjamin Duke, M.D., in his 84th year.

GRANT.—On Dec. 29th, 1929, after a short illness, at Kirkdale, Sydenham, William Francis Grant, M.D.

MACDONALD.—On Dec. 24th, 1929, suddenly, in London, as the result of an accident, Coll Reginald Macdonald, M.D., D.P.H., late County Medical Officer of Ayrshire.

RICHARDS.—On Dec. 23rd, 1929, at his residence, Grove-lane, Camberwell, S.E., G. W. Richards, M.D.

ROSE.—On Dec. 23rd, 1929, at Acocks Green, of pneumonia, Lauchlan Rose, M.A., M.D., late of Newport, Salop, and of Ministry of Pensions, Birmingham.

STUART.—On Dec. 29th, at a nursing home, after a short illness, James Stuart, M.A., M.B., C.M. Edin., of 92, Preston-road, Brighton, aged 73 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

TRAINING IN PREVENTIVE MEDICINE IN THE MEDICAL SCHOOLS.

BY ROBERT A. LYSTER, M.D., B.Sc., D.P.H.,
LECTURER IN PUBLIC HEALTH AND LECTURER IN MEDICAL JURISPRUDENCE AT ST. BARTHOLOMEW'S HOSPITAL; LATE MEDICAL OFFICER OF HEALTH FOR HAMPSHIRE.

FOR more than 25 years I have been engaged continuously in teaching public health and forensic medicine to undergraduates in medical schools, and also in the post-graduate teaching of qualified medical practitioners in training for the Diploma in Public Health. Over the same period I have been engaged in examining for medical degrees in various universities and for the D.P.H. It may, therefore, be claimed that I have had the advantage of viewing this subject from all sides, both as teacher and as examiner of graduates and undergraduates.

As a teacher for the D.P.H. I have met men who have taken their medical training in practically all the medical schools in the United Kingdom, and I have been struck particularly by two *important facts.*

1. The men taking the course had no common factor as regards their previous training in public health. Coming from different medical schools they had received varying amounts of instruction and those amounts represented different parts of the subject. It was dangerous to assume that even the majority of the class knew any particular branch of the subject to any degree.

2. In most instances the instruction they had received was completely inadequate even as an elementary introduction to the general principles of public health and preventive medicine.

During the period of 25 years covered by my experience two important changes have occurred. On the one hand, the medical curriculum has become more and more loaded with advanced clinical details which the ordinary practitioner may not be able to use in his practice, with the result that the instruction in public health and preventive medicine has never been allowed to expand and occupies, in fact, at the present time a somewhat smaller proportion of the medical curriculum than it did 25 years ago. On the other hand, the interest and knowledge of the public in this subject has increased by leaps and bounds, and we have at the present time a public thirsting for skilled guidance in health matters and in the practice of prevention.

The necessity for coördinating influences exists all through the medical curriculum. Even when learning the introductory sciences upon which medicine, and particularly preventive medicine, is founded the student gets into the habit of amassing facts and forgetting principles, and the tendency of the modern examination is to accentuate this danger instead of removing it.

He goes through his preliminary courses oblivious of the fact that, based on some of the simplest chemical, anatomical, and physiological facts, very important ideas concerning health and disease and its prevention may be founded. Even in *popular* elementary courses on this subject it is far more common to find this association and interest than in the introductory courses in the *medical schools.*

Isolation of Subjects.

Speaking generally, the various subjects are isolated from each other both in teaching and in examination, but the most marked isolation of all is reserved for public health and preventive medicine (and forensic medicine.) The creation of medical and surgical units in some schools has undoubtedly brought about a considerable degree of coördination in many ways and their existence should facilitate the introduction of "the preventive idea" into the whole curriculum.

In a lecture given at the Scientific Medical Conference held at the University of Rochester in October, 1926, Dr. Andrew Balfour, in speaking about the medical curriculum, said: "The student is *fortunate* if he gets more than an inkling of the huge subject of preventive medicine. He may, however, have an opportunity of grasping the cardinal facts that curative and preventive medicine cannot be divorced from one another, and that as a practitioner he will have duties both towards his patients and the State which it is imperative that he should fulfil to the best of his ability." Even this is sheer optimism.

The Average Practitioner.

The position is completely unsatisfactory. The practitioner of medicine is usually uninterested in and indifferent to all public health matters, and devotes himself to his sick patients, regarding preventive medicine as a job for someone else and in a few instances expressing hostile sentiments against those who practise it. His training has not been such as would be calculated to inspire him with any knowledge or interest or enthusiasm in the subject with which the general public is becoming more and more interested every year. Medical officers of health are trying to satisfy this demand for information by means of their schemes of public health propaganda, but the public appetite is very largely fed at present by the popular journalist, the stunt worker, and the sentimental fanatic, and the combined effect is deplorable. It is, in fact, difficult to exaggerate the serious character of the present position, with a public avid for health teaching on the one hand, and on the other a medical profession whose training, generally speaking, has not been such as to make it keenly interested or instructed in such matters.

In many of his writings the Chief Medical Officer of the Ministry of Health has dealt with the desirability of associating the general practitioner with preventive medicine, and has shown how easily the preventive idea could permeate the medical curriculum. So far as can be seen at present the result upon the teaching in the medical schools has been very small, and prevention is never likely to become a real part of the teaching in any medical school until a specialist teacher is appointed on the staff to deal with the subject and to press its claims.

The Medical Curriculum.

The fact is that the student is taught mainly the theory and practice of the diagnosis and treatment of diseased conditions, and that he receives little or no instruction upon prevention; he is launched into a course of instruction, investigation, and experiment which tends to concentrate attention almost entirely on treatment and cure rather than on the prevention of disease, while the study of the earliest signs of oncoming illness and the investigation of conditions leading up to it are liable to be passed over and neglected in the tremendous pressure of an overloaded syllabus.

The reason for this restricted condition of the curriculum is obvious. The training of the medical student at the present time is, for all practical purposes, entirely in the hands of eminent physicians and surgeons who have specialised in their particular departments, the result of whose excellent teaching is naturally to give the student the conviction that his life's work lies entirely among diseased persons. Such a state of affairs is inevitable under the existing arrangements in the medical schools, and it is not to be expected that the clinical teachers, who are experts in the treatment of diseased conditions, can alter their point of view and begin to teach prevention. Obviously, they must continue to teach their specialty—i.e., curative medicine and surgery. It is a matter of common knowledge that there are notable exceptional instances where a medical school is fortunate in possessing an eminent clinical teacher who is also an enthusiast in prevention, but such rare cases do not affect the general position.

The general practitioner is the main product of the medical schools, and if he is to take any important part in the prevention of disease in the future he must be taught prevention systematically and thoroughly as a student as part of an organised course in State and preventive medicine. His point of view needs to be altered, for instead of viewing the diseased portion of humanity as his special and only province, he should be expected to regard disease as something which ought to, and often could be, avoided. Such an altered point of view is not likley to be achieved without considerable innovations into the curriculum. A system which has for generations concentrated on the later stages is not likely, as the result of some small change in, or addition to a lecture syllabus, to pay sufficient attention to the investigation of predisposing conditions and the earliest stages of disease. In the interest of efficient teaching, in fact, it is necessary for each part of the instruction to be in the hands of experts—clinicians to teach diagnosis and treatment, together with investigations in those subjects, with experts in preventive medicine in charge of prevention and investigation into the factors leading to disease.

Teaching in Public Health.

All criticism and suggestions must be based upon facts concerning the present position in the medical schools of the country, and the following tabular statement has been prepared from returns made by the teachers concerned.

At St. Bartholomew's Hospital Medical College the combination of the course in public health with the course in forensic medicine under one lecturer enables the two to be dealt with as a course in "State and Preventive Medicine" occupying 30 lectures, and this arrangement has much to recommend it.

The table below shows that in the London Medical Schools the subject of public health and preventive medicine is officially allocated 12 hours of the medical curriculum. Assuming that the full medical curriculum occupies 4000 hours, the proportion occupied by public health is 0·3 per cent. In the English universities generally the attention given is substantially more, amounting to 30 hours, or 0·8 per cent., while in the Scottish universities the amount of time is *almost* doubled again, being 55 hours, or 1·4 per cent.

This subject has recently been considered by the American Medical Association in whose model curriculum the subject of public health and preventive medicine receives 3 to 4 per cent. of the entire medical course (roughly, 4000 hours) i.e., about 140 hours, so that even the Scottish universities have only travelled less than half-way towards the American model.

Hygiene and Public Health—Teaching in Medical Schools.

	Lectures of one hour.	Hours of practical work, demonstrations, &c.
LONDON MEDICAL SCHOOLS:		
Charing Cross Hospital	12	—
Guy's Hospital	12	—
Middlesex Hospital	10	3
St. Bartholomew's	10	—
St. George's	8	—
St. Mary's	10	—
St. Thomas's	12	2
University College	18	—
Westminster	12	—
ENGLISH AND WELSH UNIVERSITIES:		
Birmingham	20	5
Bristol	20	6
Durham	30	10
Leeds	20	8
Liverpool	18	10
Manchester	20	—
Sheffield	20	6
South Wales and Monmouth College	20	6
SCOTTISH UNIVERSITIES:		
Aberdeen	60	10
St. Andrew's	45	5
Edinburgh	30	10
Glasgow	50	5

The most obvious facts which appear to emerge from a consideration of the amount of instruction given to the subject of public health and preventive medicine in the medical schools at the present time are: (1) that a general levelling up in the subject of preventive medicine among the medical schools is necessary; (2) that a greatly improved position should be given to this subject as regards the time allotted to it in the ordinary medical curriculum. The advantages of such alterations would be obvious and immediate. The outstanding gain would be that the practitioner would take his proper place in the preventive system of the country, and he would be inclined to join sympathetically in the health education of the public in health matters, thereby displacing the stunt journalist and the quack from his present position. A matter of secondary advantage would be that the public health post-graduate courses would, moreover, receive a steady supply of qualified men thoroughly conversant with the general principles of public health and preventive medicine, and ready to take full advantage of more advanced teaching and also ready for instruction in practical administration. I propose to refer again to this point at the end of this paper.

Permeation of the Curriculum.

A memorandum on this subject which I prepared some ten years ago for the General Medical Council contains the following paragraph which might be quoted here:—

> It is suggested that the way in which preventive medicine could become a real live subject to the average practitioner is to introduce it properly into the medical curriculum, and the most suitable method, in conformity with modern developments, is by the creation of State Medicine Units in the medical schools. Such a unit would at first consist essentially of one professor only, with a standing similar to the professors of existing units, who would have charge of the teaching in State Medicine and who could act as a kind of "Liaison Officer" to the other parts of the curriculum on the subject of prevention.

The above suggestion is particularly interesting inasmuch as the experiment has since been carried out in the United States of America by the appointment of Prof. W. S. Leathers at the Vanderbilt University, Nashville, whose duty it is not only to carry out instruction in public health and State medicine, but also to secure as far as possible the permeation of the entire medical course with the preventive idea.

The preventive idea should permeate the *beginnings* of the medical curriculum at least as much as it should the later stages, and nothing is more calculated to arouse the interest of the student and to excite his lively attention than references to diseased conditions and their prevention, and the maintenance of health, during the courses in biology, physics, chemistry, physiology, and anatomy. All kinds of prophylactic ideas can be instilled in the mind of the student during his consideration of the chemistry of air and water. During the chemical course also toxicological matters can be introduced, while convenient opportunities can be taken to illuminate the subject with references to lime absorption by the body, dental hygiene, rickets, composition of foods, food value, and deficiency diseases. In fact, I have no hesitation in saying that, in a properly arranged curriculum, a medical student at the end of his second year ought to know far more about health and prevention of disease than he does about diseased conditions.

In connexion with the courses in anatomy and physiology there should be studied postures and the hygiene of the school classroom, exercises, eye-strain, many of the important points connected with industrial hygiene, hygiene of infancy, and all kinds of dietetic problems.

There is no need to refer to the obvious possibilities of introducing the preventive idea into the courses of bacteriology, pathology, medicine, and surgery. Ideas upon such a subject crowd into the mind which is accustomed to view medicine from the preventive side, but which are not likely to be carried out effectively unless there is in every medical school someone whose duty it is to look after this part of the training.

In an interesting paper published in the *Journal of the American Medical Association* Prof. Leathers discusses the importance of preventive medicine in the curriculum, and states the claim of preventive medicine and public health to be regarded as a major subject and department in the medical school. "There should be," he says, "in every medical school a department of preventive medicine and public health maintaining university standards in scope and ideals. Its scientific and professional status in the medical school will be weighed in comparison with the standards and development of the much older sciences of anatomy, physiology, and pathology, and others of the fundamental science group. With its present difficulties and handicaps it is much more difficult to gain the attention and maintain the consistent and sympathetic interest of the medical student in the hygienic and preventive aspects of medicine than in other branches of the curriculum. To offset this difficulty the place of preventive medicine in the medical school should be more definitely established, the regular and elective courses better defined, proper co-relation effected with clinical teaching, and its work integrated with the health services of the entire University."

At Vanderbilt University the regular course for fourth year medical students consists of 44 lectures and 66 hours of practical work, a total of 110 hours. Interesting interchanges are also arranged between the professors of preventive medicine and bacteriology, whereby the professor in preventive medicine deals with preventive items in the course of bacteriology, while the professor of bacteriology deals with that part of the course in preventive medicine which relates to the bacteriological examination of water and milk. Similarly, interchanges are arranged between preventive medicine and clinical medicine, and the remainder of Prof. Leathers's methods are best described in his own language when he says:—

> "In surgery, the control of cancer may be taught in the most graphic way. The prevention of venereal diseases and the social disease problem as a public menace can be discussed in gynæcology, obstetrics, genito-urinary and skin diseases. Child hygiene, including acute infections and problems related to nutrition, could be given special consideration in pediatrics, and maternal care in obstetrics; the prevention of blindness in ophthalmology. In the course of physiology, fatigue could be considered in relation to tuberculosis, and also the problem of nutrition affords a field for study in relation to health and disease."

Prof. Leathers concludes his interesting paper by quoting the impressive words of the late Dr. Sedgwick, who said:—

> "The medical school which fails to-day to provide also liberal instruction in preventive medicine, in vital statistics, in sanitary science, in public health laboratory methods, in epidemiology, in preventive sanitation, such as the sanitation of water-supplies and other branches of municipal sanitation; in preventive hygiene, such as mental, social, personal and dental hygiene; and in public health education and public health administration—that medical school *is sending out its graduates unprepared for* some of the most serious problems they will have to face in the immediate future."

Practical Proposals.

It is encouraging to note that these matters are now beginning to receive serious attention in many quarters. Recently the subject was discussed by the Southern Branch of the Society of Medical Officers of Health with the result that the following resolutions met with unanimous approval:—

> 1. The present system of medical training in this country is not such as is likely ever to produce in the average medical practitioner any real knowledge of, or liking for, or interest in preventive and State medicine. This lack of adequate instruction, moreover, is likely seriously to prejudice the supply of recruits for the health services of the country.
>
> 2. In view of the generally accepted opinion that preventive medicine can attain reasonable effectiveness only when the whole *medical profession* is trained in it, and takes an active part in its practice, and in view also of the fact that the interest of the *public* in preventive medicine has enormously increased recently, and is still increasing, it is desirable that efforts should be made forthwith in order to secure—
>
> (*a*) The establishment in all medical schools of a thorough and comprehensive course in State and preventive medicine as part of the ordinary medical curriculum, and associated with this course as its centre, the comprehensive infiltration of the whole of the medical curriculum with the preventive idea.
>
> (*b*) The requirement by the General Medical Council of proof of adequate instruction in preventive medicine before any candidate can proceed to any qualifying examination for a degree or diploma, and the requirement also by the G.M.C. of a special and adequate examination in this subject as part of all such *qualifying examinations.*

Much could be accomplished with the sympathetic coöperation of the examining bodies. At present the broad subject of preventive medicine is almost non-existent from an examination point of view, and the subject of public health receives but scant attention. The qualifying bodies in London do not treat it seriously, although the Society of Apothecaries grants it a share of a paper with forensic medicine, while London University gives it a half paper, and a viva voce examination shared also with medical jurisprudence. Similarly, the Scottish Conjoint Board and some of the English universities grant a half paper to the subject, but in the Scottish universities and some English ones it is raised to the dignity of a whole paper and a separate viva voce examination; in others it is combined with medicine. There is a clear case for levelling up and standardisation.

An Omen from America.

Under the English system the public health service can only be entered through ordinary medicine. In other words, the medical officer of health has, first of all, to become *a fully qualified practitioner and then he has to specialise* in public health in the form of post-graduate study. The advantages of this principle are, of course, obvious and need not be enlarged upon, but the fact remains that at present the number of entries into the public health training schools is at an alarmingly low ebb. It is therefore becoming increasingly obvious that in the public interest the medical student should have his interest stimulated in public health and preventive medicine and its ideals.

In America they appear to be trying an interesting experiment but one which has certain obvious dangers. Special schools of public health have been established which, although they include a large amount of ordinary medical curriculum, do not train students for a full medical qualification but award them, directly, a public health diploma which is, I understand, accepted as qualifying for the public health service.

I understand that the essential reason which led to this step—in my opinion, a very regrettable one—was that the number of men entering the public health service was insufficiently large, and a short cut, therefore, was devised owing to public demand. It is rather astonishing that the well-known business ability of the Americans did not try a more obvious expedient—i.e., making the public health service more attractive financially. I have been dismayed recently by certain figures which have been given me with regard to the remuneration of public health officers in the United States of America, and if these may be taken as representative of the whole service, then I am not at all surprised to hear that the number of well-qualified entrants is deplorably small.

The absolute necessity for the public health officer to be a completely qualified and even an unusually well-qualified man in general medicine and surgery is, I think, obvious to most of us. A public health officer can never be completely effective in his work unless his standing in the profession is such as will inspire respect from his professional brethren.

RESTRICTION OF LOCAL PRACTICE TO HOSPITAL Ex-R.M.O.'s.

THE medical staff of a provincial voluntary hospital asked the hospital committee to insert a clause in the conditions of appointment of the resident medical or surgical officer to the effect that he should not practise within a radius of ten miles for a period of three years after the termination of his appointment. The committee referred the matter to the Central Bureau of Hospital Information which sent out a questionaire to 51 hospitals, inquiring what was their attitude to the enforcement of such a restriction. At some of these hospitals there is one resident medical officer only; the remainder are larger hospitals, situated in industrial areas, county towns, and seaports, each with several resident medical officers.

Fifty-two replies were received, from which it appeared that in 44 (85 per cent.) of the hospitals there is no such restrictive clause in force or in contemplation. In one hospital of over 200 beds in an industrial town of over 100,000 population, there is no restriction at present, but the committee is considering making such a condition; it is stated that almost every house surgeon that has been at the hospital for the last six or seven years has afterwards settled down to practise in the town. Restrictions against practising in the hospital area are made when appointing resident medical officers at 7 out of the 52 hospitals, as follows :—

Hospital.	Number of beds.	Population of town.	Restriction against practising in the hospital area.	
			Not to practise within :	Period.
A	103	19,000	5 miles	6 months
B	96	62,000	10 ,,	5 years
C	95	46,000	5 ,,	5 ,,
D	62	26,000	5 ,,	5 ,,
E	58	37,000	5 ,,	3 ,,
F	56	23,000	10 ,,	3 ,,
G	45	40,000	2 ,,	Not stated

In the case of hospital G, the restriction is conditional, as follows: "Unless he shall have previously served as resident medical officer at the hospital for a period of not less than five years to the satisfaction of the Committee."

The following observations are extracted from the replies received from the hospitals where there is no such restriction.

(*a*) "Four house surgeons on leaving the hospital have set up for themselves here during the last 25 years."

(*b*) "In the past, many of our residents have practised in the neighbourhood and on many occasions have eventually become members of our honorary staff."

(*c*) "I have never heard of such a proposition and I consider it most unjust and think that such a step should be defeated, no matter who the medical staff are."

(*d*) "There are now three of our former house surgeons practising in our district and in each case they have gone into partnership with local practitioners."

(*e*) "No such clause exists in our appointments, and further, the committee does not agree that such a clause should be entertained."

The result of the inquiry appears as Memorandum No. 5 appended to the tenth annual report (for the year 1928) of the voluntary hospitals in Great Britain (excluding London), published by the Central Bureau of Hospital Organisation, 19, Berkeley-street, London, W.1.

NEW NURSERY FOODS.

We have received from the firm of Bickiepegs, Ltd., Welwyn Garden City, Herts, samples of three food preparations designed for the use of quite small children. The manufacturers inform us that they have been stimulated to produce these preparations by the writings of Dr. Harry Campbell and others who have laid stress in the medical press or at medical gatherings upon the value of proper mastication in the plastic formation of the tiny jaw and, thus, in the prevention of crowded teeth. The preparations consist of a vegetable broth to which veal bone-marrow has been added; some rusks of twice-baked bread, to which the name of "Chu-Chus" has been given; and some tiny little biscuits, "Bickiepegs," designed to meet a baby's need or desire, at the commencement of dentition, of something to bite upon. These minute biscuits are meant to take the place of the baby's fist, the corner of a shawl, or, indeed, any object to which a crawling baby can get access. These biscuits may well have a real use in assisting the proper eruption of the embedded teeth, where, unfortunately, an artificially nursed baby does not obtain the natural exercise afforded by breast feeding. The preparations have been produced under the direction of two well-known physicians, and the claims of good results that are made by the manufacturers would seem to rest on a sound basis.

SOME TRAVELS OF A VICTORIAN BIOLOGIST.

The late William Bateson, F.R.S., at the time a young man of 25 years of age, spent the years 1886-87 in biological research work in the Steppe. This was before there were any railway facilities in those parts and the author covered a large area of western Asia on horseback. His travels led him from the Aral Sea to Lake Balkhash, up the river Irtish to Omsk, and then westwards to Orenburg, due north of the Caspian Sea. Those who wish to know of the scientific results of the journey will find them recorded in papers in the Philosophical Transactions of the Royal Society. The letters that form the basis of the present volume[1] are those written to his mother and sisters at home, and were discovered after his mother's death in 1918, packed away in a trunk with other papers according to the fashion of hoarding correspondence which was a feature of the Victorian age useful to posterity. History repeats itself, for the author had trouble with the customs over the admission of scientific instruments into Russia. He gives a lurid picture of the art of packing a tarantass, which structure would appear to deserve his condemnation as one of the most unsatisfactory forms of carriage in existence. During his travels the natives were uniformly kind, though verminous, and the sole troubles that he had were with the authorities. At the start, in Petersburg, everyone was dilatory; he never got an opportunity of delivering a letter of introduction to a serenity, the Russian footman informing him that H.S.H. was not at home in a manner worthy of Jenkins Gruffanuff himself. His diet was that of the locality largely, and one would imagine that he never wished to taste mutton again. Some details of medical interest find a place among the letters; the results of small-pox were evident in many villages, skin diseases were common, as were ophthalmia and blindness. His servants were troublesome in the first year and unusually incompetent in the second. He suffered from diarrhoea and from a nasal discharge, acquired some veterinary skill in the treatment of sore backs, and did a great deal of temporary good to the villagers with a lotion of zinc sulphate. The book contains a couple of maps to illustrate the author's wanderings and a number of amusing drawings are printed in the margins of some of the earlier letters.

COD-LIVER OIL CREAM.

Our attention has been called to a cod-liver oil preparation made by Mr. R. Thomson, of Abbey-street, Elgin, Scotland, which has been highly commended by members of the medical profession who have used it. The emulsion is perfect and contains fresh eggs, 50 per cent. of a high grade cod-liver oil, and is newly prepared every week. In appearance it resembles dainty cream, is easy to take, and causes no unpleasant after-effects, while it is free from emulsifying agents which might affect the contents. We can recommend the preparation.

AN EXPERIMENT IN STERILISATION OF THE UNFIT.

The State of California has been carrying out, during the last twenty years, a vast eugenic experiment on the results of sterilisation of the mentally defective and unfit. We referred to the outstanding results of these investigations in our issue of May 14th.[1] In a little book[2] recently published, the gist of the pamphlets and papers scattered in various journals on this subject has been gathered together by Mr. E. S. Gosney, the philanthropist who has financed the inquiry, and Mr. Paul Popenoe, D.Sc., one of the leading eugenists concerned in it. The authors are convinced of the practicability and value of sterilisation under adequate safeguards, and their book is, of course, a piece of special pleading. It contains, however, many incontrovertible facts and should be read by everybody who is concerned at the alarming increase of mental deficiency in our country. The book goes to show that, in California at any rate, it is possible to sterilise large numbers of defective boys and girls without any appreciable risk to life, without any decrease in their happiness or usefulness, and without any of the alarming social consequences that are often threatened by the opponents of sterilisation. Appendices to the book contain a bibliography, an article by Dr. R. L. Dickenson on the surgery of sterilisation, a review of the sterilisation laws of the various States, the sterilisation figures in the various American institutions up to Jan. 1st of last year, and a review of a Roman Catholic discussion of the subject by Dr. Joseph Mayer. The book is published by the Human Betterment Foundation, a trust founded by Mr. Gosney in 1928 to perpetuate the work summarised in this volume and to endow similar social measures.

THE KOMFORT CORK SEAT.

We have received from Messrs. William Brookes and Co., sanitary seat-makers, 2, Royle-street, Oldham-road, Manchester, and 30, Langdale-avenue, Levenshulme, Manchester, a sample of a lavatory seat made of cork, stained, and covered with a varnish which is impermeable to fluids, so ensuring cleanliness. The seat has a low conductivity for heat and should therefore be comfortable for users who are sick.

A DISCLAIMER.

To the Editor of The Lancet.

Sir,—I should like it to be known that I had no knowledge of or participation in the notice of our work at the Bristol Royal Infirmary which has appeared in a lay journal.

I am, Sir, yours faithfully,

Bristol, Dec. 30th, 1929. A. T. Todd.

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[1] Letters from the Steppe. By William Bateson. Edited, with an introduction, by Beatrice Bateson. London: Methuen and Co. Pp. 222. 7*s.* 6*d.*

[1] The Lancet, 1929, i., 924 and 935.

[2] Sterilisation for Human Betterment. By E. S. Gosney, B.S., LL.B., and Paul Popenoe, D.Sc. London: Macmillan and Co., Ltd. 1929. Pp. 202. 8*s.* 6*d.*

A Study
OF
RHEUMATIC DISEASE IN CHILDREN.

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RHEUMATIC disease in children is now receiving the attention that it deserves as the most crippling affection of the children of the poor. Committees appointed during the last few years by the British Medical Association[1] and by the Medical Research Council[2] have issued reports dealing with various aspects of the problem. With most of their conclusions we are in complete agreement; but we would reaffirm the importance of heredity as shown by the family history of rheumatism or chorea—a point to which they did not attach much weight—and we would at once emphasise one of our conclusions: that routine tonsillectomy offers little hope of reducing the high incidence of rheumatism. We have tried to deal with some of the factors predisposing to rheumatism—in particular tonsillitis and other infectious diseases—and rather more fully with the importance of tonsillar sepsis and tonsillectomy; with the time of year when attacks and relapses are most likely to occur; and finally with the incidence of temporary or permanent heart disease.

Our conclusions rest on a detailed study of 250 rheumatic children. These were drawn from a poor Thames-side district in South-East London, including the boroughs of Bermondsey, Southwark, and Lambeth, served by Guy's Hospital; and of Greenwich, Woolwich, Deptford, and Lewisham, served by the Miller General Hospital. Of these children, 180 were under the care of one of us (E. C. W.) as out-patients; and 70 were watched by one of us (J. M. H. C.), again as out-patients, after their return from Queen Mary's Hospital at Carshalton where they had been given a prolonged period of treatment in the country under ideal conditions. In view of the great expense involved and the tendency to extend such facilities in many areas, it is important to compare the end-results of such treatments. All these cases have been under our personal observation for at least six months and often for three years. In general, a fairly regular attendance in the out-patient departments has been maintained, and where attendances have temporarily lapsed the children have been asked to attend again through the agency of the Lady Almoner's Department, from which invaluable help and coöperation have been obtained.

THE INCIDENCE OF RHEUMATISM.

The children we have grouped as "rheumatic" were brought to the hospital on account of one or more of the following symptoms: (1) "growing-pains"; (2) pain and swelling in the larger joints of the body; (3) chorea; or (4) rheumatic carditis (usually first noticed at the school medical inspection). The following criteria have been adopted in classifying the patients in these groups:—

1. *Growing pains.*—In recent years there has been a tendency to regard as rheumatic all children who complain of aching in the legs, but this is not correct, and it is important to differentiate two groups of cases with pains of non-rheumatic origin. The first obvious non-rheumatic group is that in which there is an acute infection with a high temperature at the same time as the pains. It is often a simple tonsillitis, or may be almost any acute infection, especially influenza, pneumonia, scarlet fever, and diphtheria. In these cases the pains subside with the main disorder. The second group are debilitated children who suffer from aching legs. In addition to their limb pains, they have recurrent bouts of pyrexia, often with vomiting, nausea, or diarrhœa; vasomotor pallor; fatigue; irritability of temper, and loss of weight. They are under-nourished and have pale faces, often with dark rings under their eyes, and muscular hypotonia with all its consequences. These children have recently received attention, especially from Cameron,[3] Vining,[4] and Osman[5]; the condition from which they suffer is variously described as debility, hypoglycæmia, cyclical vomiting, or acidosis. It is not our purpose to discuss these children apart from their relation to rheumatic disease, but they frequently suffer from limb pains which are certainly not due to rheumatism. The distinction is usually straightforward, but is complicated when debility and rheumatism occur together.

The principal diagnostic points may be summarised as follows:—

(*a*) The limb pains of the debilitated child only occur in the legs, whereas true rheumatic pains affect the arms as well, though usually to a lesser extent.

(*b*) The pains of debility only occur during or immediately after exercise and disappear with rest, whereas the rheumatic pains occur at any time and are particularly noticeable at night. Thus it is only the rheumatic child who is kept awake with pain at night.

(*c*) The pains of debility are not true pains, but an "aching" or "feeling of tiredness" in the legs. Many rheumatic children, in addition to minor aches, have severe pains as well.

(*d*) In cases of doubt, the effect of treatment may be of value. The aching of the debilitated child usually responds to treatment by sugar or glucose.[3] [5] The pains of true rheumatism do not yield to this, but of course subside with adequate doses of salicylates.

2. Severe *joint pains* with high pyrexia—the classical acute rheumatism—have become rarer in recent years, and many "joint pains" are found on analysis to be extra-articular. But typical acute rheumatism is still very common, and when there is pain in many joints, perhaps with a collection of fluid, the diagnosis is easy.

3. *Sydenham's chorea* is now accepted as a special type of rheumatic infection. In early or mild cases it may be difficult to distinguish from habit spasms or the fidgety movements of a debilitated child. Only those children have been classified as choreic in whom there was unmistakable evidence of the disease.

4. *Rheumatic carditis.*—A few children came to the out-patient department for an acquired cardiac lesion which was thought to be rheumatic, although there was no other manifestation of rheumatism.

Including all the cases of acute rheumatism, rheumatic pains, chorea, or rheumatic carditis, the percentage of rheumatic children, compared with the total out-patients over the age of three, was about 15 (Table I).

TABLE I.

—	Cases of rheumatism.	Total cases above age of 3.	Percentage of rheumatic children.
Guy's Hospital ..	90	500 (to age of 10)	18·0
Miller " ..	70	510 (" " 12)	13·7

In addition to these 160 cases and the 70 children who had been in Carshalton with rheumatic fever or chorea, 20 older rheumatic children, seen at other out-patient departments, have been included. In most of our statistics, therefore, there are 250 cases, though sometimes the number quoted is less than this because full details were not available about all of them. Of these, 38 per cent. are males and 62 per cent. females, which bears out the common belief that rheumatic disease is more common in girls than in boys. The relative incidence of rheumatism, or chorea, or rheumatism and chorea (in the same patient, not necessarily at the same time), is shown in Table II.

The preponderance of girls compared with boys is seen in each of the subdivisions of the disease. While the sex preponderance for rheumatic pains is 1·2 to 1, that for chorea is 1·9 to 1, and that for chorea with rheumatic pains is 2·5 to 1 in favour of girls. This agrees with the accepted teaching on the subject.

TABLE II.

—	All cases.	Boys.	Girls.
	250	95	155
Rheumatic pains only	124	56	68
Chorea only	47	16	31
Chorea and rheumatic pains ..	75	21	54
Rheumatic carditis, but no history of rheumatism or chorea ..	4	2	2

HEREDITY IN RHEUMATISM.

The tendency of rheumatism to run in families is well known; it is of interest from an ætiological point of view to trace the frequency (Table III.)

TABLE III.

—	Cases.	Percentage with family history of rheumatism or chorea, in brothers, sisters, parents, uncles or aunts.
Rheumatic children ..	226	58
Non-rheumatic children	162	23·5

The table shows that 58 per cent. of rheumatic children give a family history of this condition in a near relative, as compared with 23·5 per cent. of non-rheumatic children. But while it is rare for a non-rheumatic child to give a history of more than one relative with rheumatism, it is extremely common for rheumatic children. Thus amongst this series we have one family where all four children have rheumatism, and another where three out of four children have rheumatism. It is also common to find that close relatives of rheumatic children have died of rheumatic heart disease in early or middle life. Children who have had chorea show a family history of rheumatism or chorea just as commonly as children who have had rheumatism only (Table IV., col. 3).

TABLE IV.

Children with—	Cases.	Percentage with a family history (in brothers, sisters, parents, uncles or aunts).		
		(1) of rheumatism but not of chorea.	(2) of chorea with or without rheumatism.	(3) of rheumatism or of chorea.
(a) Chorea only	45	26·5	33·5	60
(b) Chorea and rheumatism	64	23·5	28	51·5
(c) Rheumatism only	117	49·5	9·5	59

Columns 1 and 2 of this table show that a child who has a family history of chorea is much more likely to develop chorea as one of its rheumatic manifestations than if there were no such history. In other words, one of the chief factors concerned with the development of chorea is an inherited tendency.

THE AGE OF INCIDENCE.

The age at which the first symptoms occur has always been a striking feature, and is illustrated in Fig. 1. We have not included cases over 10, because so many of our patients have been taken from a children's out-patient department that it would not give a fair picture of the relationship of the periods 5–9 and 10–14, and still less of the older ages.

The disease is never seen in the first two years of life, and is extremely uncommon before the age of 4. The incidence reaches a maximum during the sixth and seventh years, and then begins to fall, though we have no comparable figures for adults. We have seen first attacks of typical chorea at the ages of 18 and 21 respectively, but this is uncommon. Chorea is not met with in this series under the age of 4, although there are eight cases of rheumatic pains starting before this. In fact, when we set out the number of cases of rheumatic pains and of chorea separately (Fig. 2) there are more cases of rheumatism in the early years of life than there are of chorea. It appears that the onset of chorea is first found when the child begins to fend for itself, and mix with other children in the streets and at school. Undoubtedly the mental strain of these factors is contributory to its first occurrence, and this is in keeping with the more generally recognised fact that the strain of school life and examinations is in part responsible for chorea in older children; this accounts for the increasing number of cases of chorea among the rheumatic manifestations at the ages of 7, 8, and 9 shown in Fig. 2.

Monthly Incidence of Rheumatism.

The time of year at which the attacks develop is of importance, and there is a general impression that more cases are seen in the winter. This is borne out by Fig. 3, which shows the months during which first attacks and recurrences are most likely to occur. It does not represent the month when they attend as out-patients, but in each case a careful history has been obtained as to the actual onset. The incidence rises sharply in September, and then gradually until a maximum is reached from November to April. From May to August there are many fewer attacks. In this series 135 attacks started in the four months from November to February, compared with 71 from May to August—a proportion of nearly 2 to 1. This monthly incidence is of importance in considering ætiology, and is probably related to the damp, cold atmosphere and the lack of sunlight and vitamins—all factors which undermine the health of the city child.

FIG. 1.

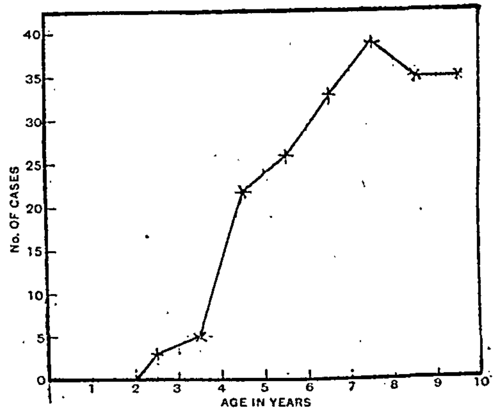

Chart showing incidence of rheumatism and chorea in children under 10.

COMMON SYMPTOMS PRECEDING RHEUMATISM.

In the absence of knowledge of the infecting agent, it is extremely important to maintain the child's health and resistance to infection; at present this is the angle from which the disease is being treated. We agree with Vining, who maintains that it is the debilitated child who develops rheumatism. We have not compiled statistics on this point as he has done,[4] but a series of common symptoms which have been complained of by the parents as occurring months or years before the first onset of rheumatism are: restlessness in sleep, night-terrors, unaccountable crying and bad temper, irritability, stammering, fainting, twitching and blinking, nocturnal enuresis, and loss of weight. The following are the notes of a typical case of a "debilitated child" who developed the first signs of rheumatism while under observation.

A boy, aged 8, was first seen in December, 1927, complaining of loss of weight and appetite for two years:

he had frequent headaches and colds in the head. He was a thin child, with rounded shoulders, poor muscular tone, and a few shotty glands in the neck. In January, 1928, he attended again and had by then developed typical rheumatic pains in his arms and legs, with mild choreiform movements and a soft apical murmur.

The child with "cyclical vomiting" is common in any out-patient department. Allied to cyclical vomiting are recurrent pyrexia and recurrent diarrhœa, and it is in this wide sense that we have grouped together children under the heading of "cyclical vomiting." It has been suggested that debilitated children are mostly of the cyclical vomiting type,[5] and are therefore liable to rheumatism. One strong argument against this is that cyclical vomiting is common among the middle and upper classes but rheumatism is very uncommon; it therefore appears that cyclical vomiting cannot be an important precursor of rheumatism. In 120 rheumatic children and 400 other unselected children, as shown by Table V., there was slightly more rheumatism in those with cyclical vomiting than in those without it, but the difference was hardly significant.

FIG. 2.

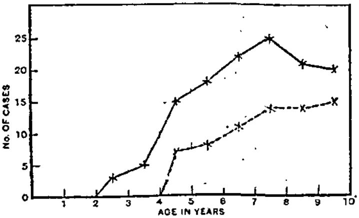

Chart showing comparative age incidence of rheumatism and chorea. Continuous line = rheumatism. Interrupted line = chorea.

TABLE V.

—	Cases.	Percentage with rheumatism.
Children with "cyclical vomiting" ..	149	28
Children without "cyclical vomiting"	371	21

RELATIONS OF ACUTE INFECTIOUS FEVERS AND TONSILLITIS TO THE ONSET OF RHEUMATISM.

Any illness which lowers the resistance of a child may predispose to rheumatism, and it is commonly taught that diphtheria and scarlet fever are particularly likely to do this. In Table VI. are summarised the illnesses which immediately preceded the rheumatic manifestations: measles and scarlet fever were equally common. The other illness which so commonly occurs just before the onset of rheumatism is tonsillitis. The limb pains occurring with acute tonsillitis usually subside within three to four days and do not recur. Among those cases where rheumatism occurred after tonsillitis there was, in almost every case, a latent period between the subsidence of the tonsillitis and its accompanying pains, and the first rheumatic pains or signs of chorea. In this series of 250 cases there were 41 with related tonsillitis. Where the tonsillitis occurred about the same time as the original attack, the relationship is shown in Table VII. In 14 out of these 19 cases rheumatism started at least five days after the onset of the tonsillitis, and in another four it started soon after, without the exact interval being known. This is important from two points of view. In the first place, it militates against the idea that the infecting agent acquires an entrance with the initial tonsillitis, unless there is a long latent period; and, in the second place, from a prophylactic point of view it is wise to keep any rheumatic child away from school, and preferably in bed, for two weeks from the start of the tonsillitis.

TABLE VI.

Disease.	Cases.	Period elapsing between onset of illness and succeeding rheumatism.
Measles	3	3 weeks; 5 weeks; indefinite
Measles and pneumonia	1	Immediate.
Measles and whooping-cough	1	Coincident.
Whooping-cough ..	1	Indefinite.
Scarlet fever	5	"Soon after"; 6 weeks; 8 weeks; indefinite (2).
Diphtheria	0	
Chicken-pox	2	Immediate (2).
Mumps and influenza .	1	2 weeks.
Pneumonia	1	5 weeks.
Influenza	2	10 days; indefinite.

TABLE VII.

			Cases.
Chorea	1 week before tonsillitis	.....	1
Rheumatism	"soon after" „	.....	4
„	5 days after „	.....	1
„	1 week after „	.....	5
„	7–10 days after „	.....	2
„	2 weeks after „	.....	4
„	4 weeks after „	.....	1
Chorea	4 weeks after „	.....	1

FIG. 3.

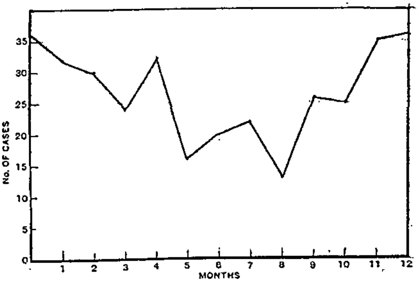

Chart showing the number of cases of rheumatism and chorea starting each month. 1 denotes January; 2, February; 3, March, &c.

HEART DISEASE IN RHEUMATISM.

The main importance of rheumatism is that it is so often accompanied by carditis. This may show itself in various ways, and the local signs in the heart fall naturally into three groups, according to the part of the heart affected. In this survey all cases have been observed for at least six months, and often for three years. It is common for a systolic murmur to be heard at the apex, especially at the height of the disease (43 per cent. of these out-patients; 69 per cent. of the in-patients from Carshalton). There were others in whom the first cardiac sound had lost definition, resulting in a "blurred first sound." Broadly speaking, there are two types of systolic murmur: (1) the soft, and (2) the harsher.

(1) The soft systolic murmur is more common, and in 44 of the 54 out-patient cases in which it occurred it ultimately disappeared. But it is almost the rule for this type of murmur to reappear with any severe relapse. It is difficult to assess the nature of the murmur when it is realised that rheumatism gives rise to inflammation of all parts of the heart. But its quality, its limited site at the apex, and its common association with an enlarged left ventricle, lead us to believe that the chief element in its production is the myocardial involvement.

(2) A harsher apical systolic murmur was met with in 11 out-patient cases, and in only four did it

disappear. This type is not localised to the apex, but is usually conducted to the axilla and up the left sternal margin. It therefore appears probable that the main factor in its production is mitral endocarditis. It is striking that this type of murmur should have disappeared completely in four cases, this disappearance being perhaps associated with a shrinkage of mitral vegetations and a greater elasticity of the mitral valve as the inflammatory exudate lessened.

In addition to the seven cases of a persistent harsh systolic murmur which developed while under observation, there were four cases with a soft systolic murmur which slowly developed into the harsher persistent and conducted murmur of mitral regurgitation. Murmurs were present in a much higher proportion of those who were treated as in-patients at Carshalton and a higher proportion were left with signs of mitral endocarditis. No doubt the higher incidence of murmurs was mainly due to the much more severe rheumatism or chorea, but partly to the fact that the patients were in bed under daily observation. As we personally did not see them at this stage we cannot make the same distinction as regards the type of murmur; but 69 per cent. developed a systolic murmur and about half of these were left with evidence of chronic changes in the endocardium of the mitral valves. In both groups there were a few patients who had signs of endocarditis when they first came under observation with fresh rheumatic symptoms (Table VIII.).

TABLE VIII.

Cardiac murmurs.	Out-patient series, 180 cases.	In-patient (Carshalton) series, 70 cases.
Endocarditis already present from previous rheumatism	10	8
Heart probably normal just before coming under observation	170	62
No murmurs noted	105	20
Systolic murmurs which disappeared—		
(a) Soft	44 } 48	18
(b) Harsh	4	
Systolic murmurs remaining—		
(1) Of doubtful significance..	6	6
(2) Indicating mitral endocarditis—		
(a) Murmur originally soft	4 } 11	18
(b) Murmur harsh throughout	7	

Heart disease is more likely to occur in cases of rheumatism than in patients with chorea who have never had rheumatism (Table IX.).

TABLE IX.

—	Cases.	Percentage with carditis.
Rheumatic pains only ..	124	51
Rheumatism and chorea ..	75	56
Chorea only	47	34

Of the 47 cases of persistent mitral murmur (including the 18 of these who had developed it from earlier attacks of rheumatism) there were 18 who had signs of mitral stenosis. Two were only 6 years old, four were 8, and eight others were still under 14. Only seven had aortic incompetence. The youngest, aged 6, only gave a history of rheumatism during the previous six months, but the size of the heart and its X ray appearances made it certain that there had been rheumatic carditis of much longer standing. Three others had aortic incompetence when first seen, aged 10 to 14; they had suffered from rheumatic fever already, on an average for two years. One of these, aged 12, had aortic stenosis; he was 9 when he had his first attack, and aortic incompetence was diagnosed with his second attack when he was 11. In the last three, aged 8, 13, and 14 respectively, aortic incompetence was noted one or two years after the attack of rheumatic fever, in each case during a relapse which would otherwise have been called a minor one.

Enlargement of the heart, as demonstrated by the apex beat and percussion of its left border, may be a fallacious sign, because a forcibly beating apex, due perhaps to excitement or pyrexia, tends to come into a wider area of the chest wall and so gives an increased area of dullness. Bearing this in mind, and restricting the term "enlargement" to cases in which it was demonstrable on succeeding visits to hospital, it was found in 37 of the 180 out-patient cases; the extent is shown in Table X. The greater degrees of enlargement persisted in nearly half the cases, but the smaller degrees tended to disappear.

TABLE X.

Degree of enlargement of the heart to the left.	Cases.	Cases examined six months to three years later:—		
		Enlargement persisting.	Enlargement disappeared.	Doubtful.
(a) Half an inch and above	24	10	12	2
(b) Less than half an inch	13	2	10	1

Clinical evidence of pericarditis or adherent pericardium was recorded in only four of the out-patient cases, and in all of these the heart was seriously affected. One case was first brought to the out-patient department on account of numerous rheumatic nodules, and routine examination revealed their presence in three other cases. In our experience they have been uncommon in London during the last five years. There was erythema in nine cases; erythema nodosum in four, and erythema multiforme in two, while in the other three the rash was not seen but there was a history of erythema.

EFFECT OF PROLONGED INSTITUTIONAL TREATMENT AT CARSHALTON IN PREVENTING RELAPSES.

An attempt has been made to compare the results of the treatment at Carshalton (on an average for eight months) with those obtained in the group treated at home and as out-patients. A small number of these had occasional treatment in infirmaries or special heart-homes, but in them the average period of institutional treatment was short, and not to be compared with the better conditions at Carshalton. Both groups here are limited to those who attended as out-patients for at least a year, and the number with major and minor relapses was agreed upon by both of us when we worked through the records together. A minor relapse is indicated by "growing pains" of rheumatic type persisting for some days, or accompanied by a mouth temperature of 100° F., and a major relapse by a recurrence of acute arthritis, carditis, chorea, or prolonged and severe "growing pains." Adopting these criteria, the results are shown in Table XI. The number of relapses in the first three years was only half as many in the children

TABLE XI.

Period of observation.	Cases.		Major relapses.		Minor relapses.	
	Carshalton.	Out-patients.	Carshalton.	Out-patients.	Carshalton.	Out-patients.
First year	70	78	3	9	7	18
Second year (where there had been no relapses during first year)	51	32	5	9	6	7
Third year (where there had been no relapses during first two years)	20	11	2	3	2	2
Total	—	—	10	21	15	27

who went to Carshalton as in those who did not. This is all the more striking when it is realised that originally they were more severe cases with a higher incidence of permanent heart disease, and so should be more likely to show relapses.

Apart from these definite relapses, there is the difficult question of deciding when an attack has really come to an end, particularly as rheumatic carditis may continue without any obvious pains. In any child with active rheumatism it is common to find pyrexia and a raised pulse-rate, and recently Bourne [6] has stressed their importance as evidence of active disease. We have the temperature and pulse-rate of every rheumatic child taken at each visit, and though occasionally there may be slight pyrexia and tachycardia due to excitement, this can be excluded if the temperature and pulse be taken by a district nurse in the patient's own home for a few days. Otherwise a persistent mouth temperature above 100° F., after all other symptoms and signs of active rheumatism have disappeared, generally means active or smouldering disease, and needs treatment. As the active disease subsides, so does the temperature, usually to 98° F. This pyrexia, and the pains, may be masked if salicylates are given, and as there is no evidence that they have any beneficial effects once the acute pains have subsided we make it a rule never to give them to an out-patient after the acute phase. Even in the absence of pyrexia, tachycardia—e.g., in a child of 10–12 years a pulse-rate above 100—persisting after the acute symptoms have subsided is in many cases due to a smouldering carditis, of which there may be no other evidence. Most children have sinus arrhythmia during health, and a return of this usually means a subsidence of acute rheumatism.

THE TONSILS IN RHEUMATIC AND NON-RHEUMATIC CHILDREN.

There are such conflicting opinions about the importance of tonsillar sepsis in rheumatism that a special study has been made of this problem. The proportion of rheumatic and non-rheumatic children who give a history of one or more attacks of tonsillitis is the same (Table XII.).

TABLE XII.

—	Cases.	Percentage with history of tonsillitis.
Rheumatic children ..	166	58·4
Non-rheumatic " ..	250	58·0

Another method of investigating this relationship is to compare the tonsils of rheumatic and non-rheumatic cases. It is difficult to define what is meant by septic tonsils, but the points considered were the degree of redness, the superficial scarring, the presence of large red granulations projecting from the surface, and the amount of debris in the crypts. These criteria apply equally to the tonsils of both groups, and the results, set out in Table XIII., show no significant difference between the two sets of children.

TABLE XIII.

—	Cases.	Percentage distribution according to condition of tonsils.		
		Very septic.	Septic.	Doubtful or not septic.
Rheumatic children ..	145*	6	45	48
Non-rheumatic " ..	412*	5	48	46

* See footnote to Table XIV.

A method of assessing the degree of septic absorption from the tonsils is by measuring the size of the tonsillar group of lymphatic glands. This is less subject to the personal equation of the observer than estimating the degree of sepsis of the tonsils themselves, and is perhaps more reliable. Applying this classification to the rheumatic and non-rheumatic children, we get the results shown in Table XIV. If there is any significant difference, the size of the tonsillar glands is less in the rheumatic children.

TABLE XIV.

—	Cases.	Percentage distribution according to size of tonsillar glands.			
		Very large.	En-larged.	Readily palpable.	Not readily palpable.
Rheumatic children*	145	9	40	38	13
Non-rheumatic " *	284	14	49	25	12

* Tonsillectomised children are excluded from both groups.

The influence of tonsillar sepsis may be summarised by saying that the tonsils are not more septic, and that the degree of septic absorption (as judged by the size of the tonsillar lymph glands) is rather less in the rheumatic than in the non-rheumatic group.

Influence of Tonsillectomy on the Subsequent Onset of a First Attack of Rheumatism.

Many enthusiasts claim that tonsillectomy would have prevented the first manifestations of rheumatism, but our statistics do not support this view. The term tonsillectomy has been restricted to patients whose tonsillar bed was completely free of all remnants. Cases in which the removal was incomplete are considered separately. The non-rheumatic children are fair as a control group of the population in the hospital neighbourhood, as the majority attend for minor ailments (such as common colds). In each of the children who developed rheumatism a careful history was taken to be sure that complete removal of the tonsils took place before the first manifestation of rheumatism. These results are expressed in Table XV.

TABLE XV.

—	Cases.	Percentage who subsequently developed rheumatism.
Children with complete tonsillectomy*	124	15·3
Children whose throats have never been operated upon*	843	15·6
Children with incomplete tonsillectomy	43	32·5

* The average time elapsing between tonsillectomy and the development of rheumatism was just under two years; the average time between tonsillectomy and the first attendance of the non-rheumatic children at the out-patient department was the same, so that the figures are quite comparable.

Complete enucleation of the tonsils is without effect in preventing the onset of rheumatism, the proportion of children who subsequently develop rheumatism being the same as if the tonsils had not been enucleated. But the series of children with an incomplete tonsillectomy before the onset of rheumatism shows a much greater tendency to develop rheumatism. As this group comprises 25 per cent. of the cases with a tonsillar operation it is a sufficient justification for insisting that this operation shall always be done by skilled hands, so that the enucleation is complete.

Of the 24 children who had tonsillectomy before the onset of rheumatism, 14 developed chorea and 10 developed rheumatic pains in their first attack; the *first* manifestation is therefore more commonly chorea than rheumatic pains. This is contrary to what happens in non-tonsillectomised children, and agrees with the findings of the Medical Research Council Report [2] that in *recurrent* attacks after tonsillectomy, chorea is more likely to be met with than if tonsillectomy had not been performed. In view of the possible relations of diseased tonsils to rheumatic heart disease we are summarising this investigation with reference to tonsillar sepsis in non-rheumatic children, and in rheumatic children without cardiac involvement, with temporary cardiac involvement, and with permanent cardiac involvement (Table XVII.). There is no evidence that there is any relationship between tonsillar sepsis and the development of temporary or permanent carditis. It is important to see whether complete tonsillectomy before the onset of rheumatism causes the heart to be spared when rheumatism develops. The results are shown in Table XVIII., and there is no evidence at all that the heart is spared. Contrary to the suggestion of Reginald Miller,[1] tonsillectomy is no more use as a prophylactic against the heart becoming involved in cases of rheumatic fever than in cases of chorea. Actually in our series the highest percentage developing carditis was among the choreic children whose tonsils had been removed earlier.

TABLE XVI.

—	Cases.	Percentage with the first manifestation as—	
		Chorea.	Rheumatic pains.
Rheumatic children with—			
(*a*) Tonsils removed before the first symptoms of rheumatism	24	58	42
(*b*) No operation on tonsils ..	161	33	67

TABLE XVII.

Percentage distribution of cases according to the condition of the tonsils.

	Non-rheumatic.	Rheumatic—		
		Without cardiac signs.	Temporary cardiac signs.	Permanent cardiac signs.
Cases	412	75	48	22
	Per cent.	Per cent.	Per cent.	Per cent.
Condition of tonsils—				
1. Very septic	5	4	6	14
2. Septic	48	41	54	43
3. Doubtful or normal	46	54	41	43
Size of tonsillar glands—				
1. Very large	14	7	16	9
2. Enlarged	49	44	34	32
3. Readily palpable ..	25	40	34	41
4. Not readily palpable	12	10	16	19
History of sore-throats..	58	57	56	58

TABLE XVIII.

—	Cases.	Percentage with carditis.*
Rheumatic children with—		
(*a*) Complete tonsillectomy before the onset of rheumatism	24	46
(*b*) No operations on tonsils	161	45

* The term carditis is used where an organic systolic murmur was present (76 cases), and in cases with at least half an inch enlargement of the left ventricle beyond the nipple line (seven cases).

SUMMARY AND CONCLUSIONS.

Rheumatism occurs so frequently in the children of the poor that 15 per cent. of these above the age of 3 attending two hospitals in South-East London attend for this disease. Our impression is that the poorest are the most commonly affected, and it is certainly as common in them as in children of the artisan class. This is contrary to the findings of the Reports of the Medical Research Council and the British Medical Association.[1,2]

Among these 250 cases three girls are affected for every two boys, and this sex preponderance is more marked in chorea. Rheumatism rarely occurs before the age of 4, and chorea rather later. The commonest age for the onset is 6 or 7 years, after which there is a slight decline. But later chorea forms a larger proportion, probably owing to the strain of life at school.

A family history of rheumatism occurred in nearly 60 per cent. of these cases, but in only just over 20 per cent. of some non-rheumatic controls; it is therefore an important ætiological factor. Further, it has an influence in determining which rheumatic manifestation is likely to occur, for chorea was found more often where there was a family history of chorea.

An attack of rheumatism is more likely to start during the winter months from November to April.

One of the most important factors predisposing to rheumatism is a debility. Thus an attack often follows the specific fevers—e.g., measles or scarlet fever. "Cyclical vomiting" is of little importance in this respect.

In the same way tonsillitis may predispose to rheumatism. In almost every case in this series, where there was a history of related tonsillitis, there was a latent period of from several days to three to four weeks. If the infecting organism gains an entrance during the attack of tonsillitis this is contrary to the idea that it is a streptococcus. Children who have once had rheumatism should be kept indoors for at least two weeks after tonsillitis.

A systolic murmur was heard during the height of the illness in about half these patients, and was much less common in chorea than in other cases of rheumatism. Permanent signs of heart disease remained in 15 per cent. of the "out-patients" and in 30 per cent. of those who had been treated as in-patients at Carshalton, obviously because these had suffered from much more severe attacks of rheumatism or chorea. In spite of this there were only about half the number of relapses among those patients who had been given a long course of institutional treatment at Carshalton.

There is no evidence that the tonsils of rheumatic children are more septic than those of non-rheumatic children attending as out-patients. The frequency of tonsillitis, the septic appearance of the tonsils, and the degree of enlargement of the tonsillar lymph glands are similar in the two groups. Moreover, complete enucleation of the tonsils before there were any signs or symptoms of rheumatism (on an average two years before) did not prevent its onset or diminish its frequency. Nor did it in any way lessen the incidence of rheumatic carditis. Thus there is no evidence to support routine tonsillectomy at an early age as an attempt to prevent rheumatism. Incomplete enucleation of the tonsils is followed by an increased tendency to develop rheumatism. The only justification for their removal in a rheumatic child is when the general health is being undermined by repeated sore-throats or very septic tonsils. Especially is their removal contra-indicated during or immediately after an attack of rheumatism.

We should like to thank Dr. H. C. Cameron, in whose out-patient department some of these children attended at Guy's Hospital, and the medical superintendent of Queen Mary's Hospital, Carshalton, for the notes about other patients during their residence there. One of us (E. C. W.) would like to acknowledge a grant from the British Medical Association which helped in this work.

REFERENCES.

1. Brit. Med. Jour., 1926, ii., Supplement, p. 1.
2. Med. Res. Council, Special Report No. 114.
3. Cameron, H. C.: Brit. Med. Jour., 1920, i., 185.
4. Vining, W.: Ibid., 1929, i., 629.
5. Osman, A. A.: Ibid., 1929, i., 150.
6. Bourne, G.: THE LANCET, 1928, ii., 217.

INFECTIOUS PUERPERAL FEVER.

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ALTHOUGH it is admitted that puerperal fever may arise from a pre-existing focus in the genital tract, such as the glands of the cervix, examples of auto-infection are considered to be rare, and for a long time it has been customary to teach that the inflammatory sequelæ of labour are due to direct inoculation of some part of the birth canal from without. As a result of these modern views, which the general public has been quick to absorb, there is a widespread impression that puerperal fever is usually set up by direct contact, and is therefore the result of faulty technique or lack of skill on the part of the midwife or doctor.

Whilst no modern surgeon will question the necessity for a careful technique in the conduct of labour, there can be no doubt that the importance of such technical details has been greatly exaggerated; indeed, the employment of an elaborate ritual is in itself open to criticism, for it is obviously absurd to regard the natural act of labour as a surgical emergency. Striking proof of this assertion is afforded by the figures produced at the Congress on Puerperal Sepsis held in London in 1925, where it was shown that of all the fatal cases of puerperal sepsis presented to the meeting approximately 30 per cent. had occurred after perfectly normal labours, and the bulk of fatalities was not derived from patients who had received serious shock and trauma during labour. On the contrary, it is a by no means uncommon experience to find that many patients who receive a great deal of trauma during delivery make uninterrupted and afebrile recoveries, and it has long been known that the incidence of puerperal fever is not necessarily increased by the presence of infective vaginal discharges during pregnancy. These anomalies are partly explained by the variations in virulence of the causal organisms, and partly by the different degrees of immunity that are found in individual patients, but these variants are not a complete explanation of the astonishing but well-established fact that severe and sometimes fatal puerperal sepsis may follow a perfectly normal labour conducted in the presence of the most modern surgical surroundings.

It is, of course, universally acknowledged that birth injuries and faulty technique are both dangerous allies of puerperal infection but, if septicæmia may and actually does develop without their assistance, it is clear that other factors must be taken into account in order to explain the origin of the fever. Amongst these factors are two which have received little attention, namely:

1. The invasion of the body through extragenital portals such as the throat.
2. The occurrence of indirect modes of infection as opposed to direct contagion in the spread of the disease.

In order to illustrate how by these means puerperal sepsis may assume an epidemic form, we wish to bring forward a group of cases lately under our care, in which the birth canal was not the portal of entry, and the organisms were not conveyed by the hands or instruments of the obstetrician.

Case 1. July 28th.—A young primipara, three weeks after a normal labour and an afebrile puerperium, developed a sore-throat, fever, and a typical scarlet rash, and was transferred to the fever hospital.

Case 2. August 1st.—A multipara who had been delivered normally the previous day complained of a sore-throat and some backache, and was found to have a temperature of 100° F. The next day there was pain in the breast and later a breast abscess was opened and drained. The baby developed in the right eye an ophthalmia, bacteriologically negative to gonococci.

Case 3. August 1st.—A multipara on the seventh day of the puerperium developed a temperature of 101° F. which persisted for some days without other symptoms, except increase of the pulse-rate.

Case 4. August 1st.—A multipara who had been delivered of twins nine days previously was found to have a temperature of 102·8° F. and a rapid pulse. Glycerin injections of the uterus were started, and she was given anti-scarlet fever serum and radiostoleum capsules. Throat swabs were negative, but she had the clinical appearance of septicæmia, and for some considerable time was dangerously ill. She eventually recovered. Both babies developed fever and scarlet rashes; both recovered.

Case 5. August 5th.—A two-para was delivered of living twins on August 3rd, the labour being perfectly natural in every way. On the 5th the temperature rose to 103·4° F. and the pulse-rate to 134. Glycerin injections and anti-scarlet fever serum were given, but the patient died on August 9th, six days after delivery. The post-mortem showed the usual signs of septicæmia. Both babies developed scarlet fever, and one died two days after the mother. The second was transferred to the fever hospital.

Case 6. August 6th.—A multipara delivered on the 1st inst. complained of general malaise and some tenderness in the right breast. The temperature rose to 101° F. and the tongue was slightly suspicious of scarlet fever. She was given anti-scarlet fever serum, and gradually recovered without any local infection of the breast. The child ran a temperature between 99° and 100° for ten days, and showed an atypical scarlet rash on both legs.

Case 7. August 10th.—A baby born on the 5th was found to have a temperature of 102° F. A scarlet rash appeared two days later; the mother remained afebrile.

Case 8. August 12th.—A multipara delivered six days previously complained of acute pain in the groin with fever; later the right breast was inflamed and she developed an abscess. The baby ran a temperature for some days without any other symptoms. Both made a good recovery.

Case 9. August 23rd.—A baby four days old developed a rash on its chest and a temperature of 102·4° F.; the rash was suggestive of scarlet fever. The mother also ran a slight temperature, and had a painful nodule in one breast.

Case 10. August 24th.—A multipara developed a temperature of 104° F., with quickening of the pulse-rate. She had been delivered normally three days previously and was subject to rheumatism. The pyrexia persisted for some days, but there were no other physical signs. The baby, however, developed a scarlet type of rash which was accompanied by a slight rise of temperature.

Ophthalmia.—Between July 30th and August 9th five cases of ophthalmia were reported in the wards. The swabs of all were negative to gonococci; three of the cases were unilateral and two bilateral.

These cases of puerperal sepsis constitute a small epidemic of scarlet fever, for although the clinical manifestations were neither uniform nor typical, but included breast infection and ophthalmia, we have no doubt that the whole series was due to the same organism and derived from the initial case of scarlet fever. Fortunately the latter was typical and easily recognisable, for if the nature of the illness of this patient had been overlooked (and ambulant cases of scarlet fever may easily escape notice), then the whole significance of the epidemic would have been missed; the fever would have been attributed to the ordinary channels of infection, and this would have led to a careful but futile revision of the technique in use in the hospital. Such an inquiry was, indeed, carried out in the present instance, but it threw no light on the origin of the outbreak; no fault could be found in the methods or the personnel, whose efficiency is established by the morbidity-rate of the hospital, which is definitely below the average. In our opinion the septic manifestations in these women and babies were the result of invasion by an air-borne organism, and not due to primary involvement of the genital tract through direct contact. We do not wish to tonsillectomy, chorea is more likely to be met with than if tonsillectomy had not been performed. In view of the possible relations of diseased tonsils to rheumatic heart disease we are summarising this investigation with reference to tonsillar sepsis in non-rheumatic children, and in rheumatic children without cardiac involvement, with temporary cardiac involvement, and with permanent cardiac involvement (Table XVII.). There is no evidence that there is any relationship between tonsillar sepsis and the development of temporary or permanent carditis. It is important to see whether complete tonsillectomy before the onset of rheumatism causes the heart to be spared when rheumatism develops. The results are shown in Table XVIII., and there is no evidence at all that the heart is spared. Contrary to the suggestion of Reginald Miller,[1] tonsillectomy is no more use as a prophylactic against the heart becoming involved in cases of rheumatic fever than in cases of chorea. Actually in our series the highest percentage developing carditis was among the choreic children whose tonsils had been removed earlier.

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—	Cases.	Percentage with the first manifestation as—	
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REFERENCES.

1. Brit. Med. Jour., 1926, ii., Supplement, p. 1.
2. Med. Res. Council, Special Report No. 114.
3. Cameron, H. C.: Brit. Med. Jour., 1929, i., 185.
4. Vining, W.: Ibid., 1929, i., 629.
5. Osman, A. A.: Ibid., 1929, i., 150.
6. Bourne, G.: THE LANCET, 1928, ii., 217.

occurs at a distance from the actual site of injection. With quinine, on the other hand, there is a distinct tendency for the inflammatory process to spread widely beyond the point of injection. In several of our cases this spread was very extensive, a single injection in the calf resulting in an intense reaction affecting the whole length of the saphenous vein *right up to the saphenous opening.* Failure to produce any reaction at all was more common with the weaker (20 per cent.) sodium salicylate solution.

Everyone agrees that the pain produced by sodium salicylate, especially the stronger solutions, is a serious disadvantage. It is true that a local anæsthetic such as ethocaine may be added, but this involves a risk of unrecognised extravasation, as emphasised by Sicard.

Quinine and urethane injections are not open to this objection, but the after-aching may be considerable, and in a few of our cases intense and cramp-like pains have followed use of this solution; in one or two instances these have persisted for several weeks. Lastly, the duration of treatment in cases with extensive varicose veins often proves long and wearisome.

It seems to us therefore desirable to find some substance which will more completely satisfy the ideal requirements. We suggest that sodium morrhuate will do so. This substance has been employed as an intravenous injection for other therapeutic purposes, and one of us (P. B. K.) had noted its effect on the vein injected and suggested its possibilities for our present purpose. Accordingly it was tried and proved satisfactory. By careful observation and experiment over a prolonged period we have arrived at what we consider to be the most advantageous method of using it.

Sodium morrhuate is the sodium salt of a fatty acid extracted from cod-liver oil. In solution it is dark brown in colour, soapy in consistency, and has the characteristic cod-liver oil smell. It has been prepared for us by the British Drug Houses, Ltd., in ampoules containing 5 c.cm. of the sterilised solution. A small quantity of carbolic acid (to 0·5 per cent.) is added as a preservative, though this is not absolutely necessary. We would emphasise the fact that the carbolic has nothing to do with the reaction produced on injection, as the pure solution gives the same results. The two strengths prepared for us are 5 per cent. and 10 per cent. In cold weather the solution will frequently appear partially coagulated. The phial should then be immersed for a few minutes in warm water, when the contents will clarify except for a slight permanent haze. It is not necessary to inject the solution hot. In loading the syringe it is advisable to employ a large-bore needle, as the solution rather easily becomes frothy. This is changed for the fine needle before making the actual injection.

Effects of Injection.

1. *General.*—Sodium morrhuate has no toxicity, and amounts up to 10 or 12 c.cm. of the 10 per cent. solution have been given at one time. No general symptoms have occurred in any of our cases. The solution lakes the blood as does sodium salicylate, but this effect seems of no practical consequence.

2. *Local.*—The effect on the injected vein is usually prompt and striking. The vein at the site of injection becomes swollen and hard within a few moments for a distance up to an inch. On withdrawal of the needle the puncture seals itself quickly and subsequent extravasation does not occur. This fact enables a succession of punctures to be made rapidly with safety. In certain cases the vessel wall contracts, and swelling and hardening do not appear; though this usually augurs failure, obliteration of the vein lumen not infrequently follows. An important point is that sodium morrhuate is for practical purposes innocuous to the subcutaneous tissues. One of us (P. B. K.) has injected quantities up to ½ c.cm. into his own arm without any ill-effect beyond a slight local tenderness. The reaction on the vein produces very little discomfort. There is usually an aching sensation and a feeling of stiffness, which may persist for 24–48 hours, but it is seldom at all severe.

3. *Subsequent Course.*—The treated vein passes through the stages well recognised in the case of other irritants. The firm solid swelling persists, and we would emphasise the fact that the total effect is usually seen immediately after the injection is made. During the succeeding days the reaction shows little or no tendency to spread, either along the course of the vein or through its wall. In other words, obliteration of the lumen is ensured with a minimum of inflammatory reaction.

Details of Technique.

Dosage.—The 5 per cent. solution is usually quite strong enough. We only use the 10 per cent. strength when the weaker solution has failed or has produced a thickening of the vein wall without obliteration of the lumen. In most cases ½ to 1 c.cm. is the correct dose for each injection, the exact amount being determined by the size of the vein. The reaction produced is in direct proportion to the quantity of the solution injected. Over-dosage will lead to excessive local reaction, and some of our earlier cases developed a periphlebitis from this cause. With correct dosage and spacing of punctures we are confident that periphlebitis should be rare.

Total Dosage.—We have found it perfectly safe to go up to 10 c.cm. at one sitting, and indeed we have exceeded this. In practice such large quantities are not often required; in most cases all affected veins can be dealt with at one sitting without the use of anything like this total quantity. Some nervous patients are unable to tolerate many punctures at one time, and this may limit the extent of vein which can be treated at a sitting.

Method of Injection.—Sodium morrhuate appears to give its best reaction in a distended vein. Therefore the injections are made with the patient standing, except where the veins are so large as to remain full when he is sitting or lying down. Each puncture is made with the usual precautions, using a fine needle and an all-glass syringe. Each dose is injected rapidly; the needle is withdrawn and the skin is momentarily compressed while the next puncture is being made. Oozing ceases automatically as the vein swells. Successive injections are made rapidly, usually from above downwards, the sites selected being spaced out so that an inch and a half to two inches of vein intervenes between each. The patient lies down for a few moments after the injections. The puncture wounds may be touched with collodion, but usually no application at all is needed and we dispense with all bandages or other forms of compression.

If a further treatment is necessary it is arranged after a week's interval. If all the injections considered necessary have been completed, an inspection is made a month later and any further injections which may be considered needful are then given.

Results.

We have used this solution exclusively in treating varicose veins for the past ten months. During that period we have dealt with 187 cases. Among this series there has been no instance of necrosis, and there have been only 13 known instances of periphlebitis. The average number of sittings has been 1·82 per case. In such cases as we have been able to see after an interval of six months has elapsed the results have been satisfactory.

Conclusions.

In sponsoring this new addition to the lengthy list of therapeutic agents employed in the treatment of varicose veins we feel justified in claiming for it certain merits. 1. The solution is free from the risk of general toxic effects. 2. The phlebitis induced is effective and controllable, and the risk of local complications is slight. 3. The treatment is as free from pain and discomfort as can be reasonably expected of any artificially induced inflammatory process. 4. The time occupied in treatment is the briefest possible.

THE ASCHOFF NODULE IN RHEUMATIC PNEUMONIA.

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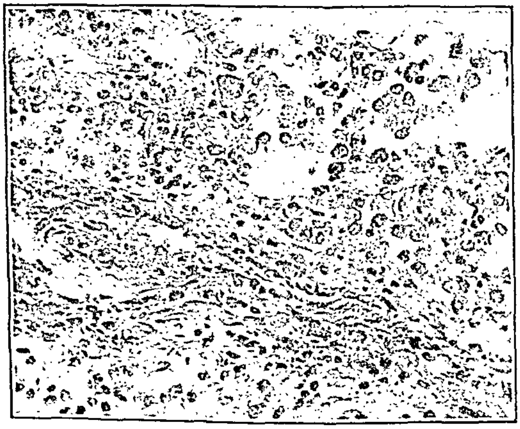
IT has long been known that the lungs may be affected during the course of acute rheumatic fever, and much has been written on the subject from the clinical point of view. The pathogenesis of the lung condition has, until lately, been unknown, chiefly owing to lack of material for investigation, since few subjects of this disease die during the acute stage. The clinician has generally regarded the lung signs and symptoms in acute rheumatic fever as a sequel to cardiac insufficiency, pleural effusion, paralysis of the diaphragm, or to pressure on the lung from an enlarged heart or pericardial exudate. The frequent implication of the base of the left lung has lent support to some of those theories. Rabinowitz, however, in 1926[1] studied a series of patients in the acute phases of rheumatic fever, paying particular attention to the pulmonary signs and symptoms. He found that there was a group with pulmonary manifestations which could not be explained as secondary to cardiac insufficiency or pressure. These cases showed irregular elevation of temperature, areas of marked dullness in the chest, and loud bronchial breathing. Upper respiratory symptoms were slight. These signs were of a fleeting character, disappearing in one area to reappear soon in another, and as a rule did not influence the prognosis. Rabinowitz did not have much opportunity for histological examination, but believed that the condition must be a specific pneumonia due to the virus of acute rheumatic fever. We now know that a particular type of pneumonia is the cause of those chest signs. Naish[2] was the first to describe some of the histological features of this pneumonia and to emphasise its specific nature. He did not find the Aschoff nodule in the lungs of his cases. The purpose of this paper is to bring forward further proof that such a pneumonia does occur, and that it is of a specific type, since it bears the signature of the acute rheumatic fever virus—the Aschoff nodule.

FIG. 1.



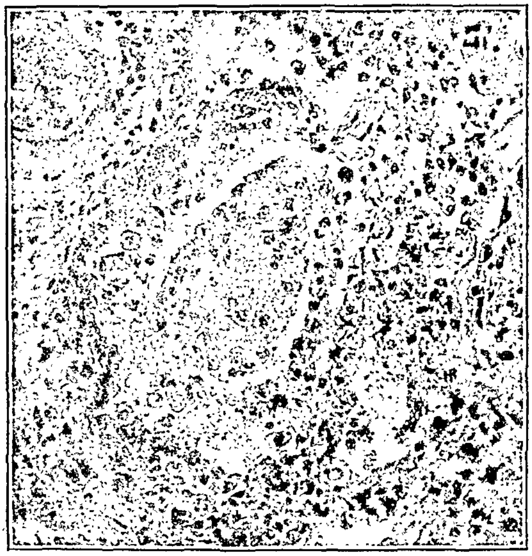
Proliferation of pleural endothelial cells with cellular infiltration and fibrosis of the subpleural tissue.

During the course of a pathological investigation into rheumatic fever patients, dying apparently in the acute stage, pulmonary lesions were found in two.

Clinical History and Autopsy Findings.

CASE 1.—A. B., female, aged 20. Admitted to hospital in an acutely ill condition with swollen painful joints and pain in the chest. History of an attack of acute rheumatic fever two years before. Temperature 102·4° F. on admission, then varying each day from 98·6° F. in the morning to 101° F. in the evening. Pulse-rate remained almost constant at 120. Respiration varied between 40 and 48. There was dullness and bronchial breathing at the back on both sides of the chest well up to the apex. A diagnosis of pneumonia was made. Death took place on the eleventh day after admission. Some days before death about 120 c.cm. of blood-stained fluid was withdrawn from the pericardial sac. A fibrin clot formed in this fluid soon after. The cell count was polymorphs, 72 per cent.; lymphocytes, 21 per cent.; endothelials, 7 per cent.

FIG. 2.



An alveolus full of alveolar cells. The cells at the periphery are degenerated.

Post-mortem examination revealed a typical acute rheumatic pericarditis and endocarditis of the mitral and aortic valves. The heart was enlarged, and on microscopic examination of the myocardium many Aschoff nodules were found. There was a little blood-stained fluid in each pleural sac. Both lungs were markedly congested and heavy, also the lower lobes had a rather solid feel. There were small groups of subpleural punctate hæmorrhages scattered here and there over both lungs. On the pleural surface of both lower lobes there was a thin, somewhat rugose, fibrinous exudate. The consistency of these lobes was like solid indiarubber. The cut surface exuded blood, and was smooth in appearance. The general colour was a purplish red, but here and there a few greyish areas were seen. The surface was not uniformly solid in appearance, owing to the presence of aerated portions in places. Small pieces cut from the solid areas just floated when placed in water. The liver and kidneys showed marked parenchymatous degeneration, and the spleen was double the normal size. The cut surface of the spleen showed acute congestion, but there was no softening of the pulp. Cultures made from the surface of the freshly cut lung were sterile.

CASE 2.—C. D., male, aged 15. Admitted with a diagnosis of meningitis. Died two hours after admission. No history of previous illness, except that the patient was subject to curious fit-like attacks when in bed at night. These attacks lasted about ten minutes, and had been going on for 15 months.

Post-mortem examination.—Thrombosis of the internal jugular vein, right lateral, and longitudinal sinus, and most of the cerebral veins on the right side with a few on the left. No evidence of ear or sinus infection. The heart showed hypertrophy, and there was typical acute rheumatic endocarditis of the mitral and aortic valves. There was no evidence of old or recent pericarditis. A microscopical examination of the myocardium revealed patchy fibrosis, but no Aschoff nodules. The medium-sized coronary arteries, however, showed endarteritis. This endarteritis was of the type found occasionally in the coronaries of old-standing rheumatic fever cases. There was chronic venous congestion of the lungs, and the pleura over both lower lobes was much thickened. Section of the left lung revealed in the cardiophrenic angle a moderately large solid area. The surface was pale and smooth, with fibrous areas here and there, and an occasional cystic bronchial space. Cultures made from the freshly cut surface of this solid part of the lung were sterile.

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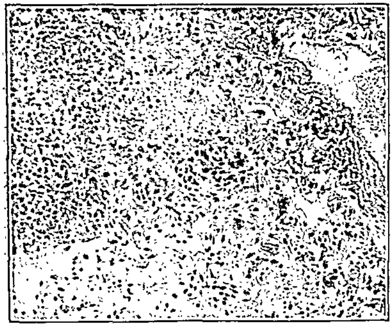
[1] Rabinowitz, M. A.: Jour. Amer. Med. Assoc., 1926, lxxxvii., 142.

[2] Naish, A. E.: THE LANCET, 1928, ii., 10.

FIG. 3.



An Aschoff nodule in an interlobular septum.

Pathological History of the Lungs.

A microscopical examination of the lungs from Case 1 revealed a characteristic form of pneumonia and pleurisy which has not yet been completely described by any observer. The pneumonic lesion was rather patchy in its distribution with some tendency to be confined to lobules. Between these patches the lung tissue presented the appearance of chronic venous congestion. In one respect there was a slight resemblance to what is seen in ordinary broncho-pneumonia, for at the peripheral zone of the pneumonic areas the alveoli contained serous exudate and a few cast-off alveolar cells.

Since all stages of the morbid process may be present in any chosen area it facilitates matters to describe the changes as they were seen in the different lung structures.

Pleura (Fig. 1).—There was marked proliferation of the pleural cells, which were found in several layers and in small heaps entangled in a thick fibrinous exudate. Many of these cells were large and multinucleated. In places the more or less normal pleural endothelium was being raised by a fibrinous exudate underneath, and in other parts this exudate lay on the surface and endothelial cells were absent. The subpleural layer was undergoing fibrotic transformation, and all the vessels showed marked endothelial proliferation, even to complete blocking of the lumen. In and around the walls of these vessels there were collections of cells of varying type, but an endothelial cell with vesicular nucleus predominated. The others were lymphocytes, plasma cells, or connective tissue cells. Polymorph leucocytes were not seen in any great number. These vessel changes were found not only in the subpleural layer but everywhere throughout the lung, and will be described more fully further on.

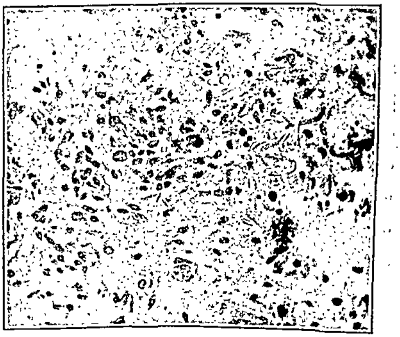
Alveoli (Fig. 2).—The proliferation of the alveolar lining cells was the most prominent feature; many of these cells were multinucleated. Cells containing pigment granules were scanty. Usually a few polymorphs or lymphocytes were present in the alveolus in addition to the others. The later change in these alveolar cells was rather striking. They became necrotic and their fused necrotic protoplasm formed a ribbon-like lining to the inner surface of the alveolus. The centre of the alveolus contained a few mononuclear or polymorphonuclear cells and sometimes serous exudate. In many places this ribbon-like mass was found lining larger cavities which had arisen by fusion of two or three alveoli through disappearance of the intervening alveolar walls. Occasionally areas were found containing nothing but polymorph leucocytes, with the remains of alveolar septa scattered here and there.

Bronchi.—The bronchial wall was infiltrated with small round cells, endothelial cells, and fibroblasts. At later stages the muscle and fibrous layers became disintegrated, and there was some proliferation of the mucosa cells so that they formed two or three layers. The final stage of this process was either complete disappearance of the entire wall and mucosa or the formation of a cyst-like cavity lined by the remains of the bronchial wall. The presence of an occasional globular-like body in areas where there were no traces of bronchial structure was rather puzzling, until they were traced out as the globular remains of a bronchial cell. The bronchi lying outside the affected parts of the lung were unchanged.

Connective Tissue.—The changes here were chiefly of a proliferative and exudative character, associated with the appearance of endothelial-like cells and necrosis of the collagen fibrils. These endothelial cells varied in size—some being very large and multinucleated. As many as nine nuclei were seen in one cell. The cytoplasm of these cells tended to be basophilic and the nuclei were vesicular. They were most conspicuous in the fibrous septa of the lung. Sometimes there were rows of such cells forming a palisade arrangement along the septa. In places they were grouped as rounded nodules, and at times the outpouring of a serous exudate into the interstitial tissue had scattered the cells far and wide. Occasionally fibroblasts were seen, particularly in those parts of the septa where the endothelial cells were scanty. *The nodules were made up of these endothelial* cells with here and there, generally at the periphery, a few lymphocytes or plasma cells. Neutrophil polymorphs were as a rule scanty and eosinophils were absent. Very rarely a nodule was seen composed of two or three endothelial cells surrounded by polymorphs only. Usually the centre of the nodule was occupied by granular material suggesting necrotic endothelial cells, and occasionally streaks of fibrin were seen lying between the cells. The nodules, as a rule, were found in close association with the smaller vessels, and in some cases the nodule cells were penetrating and destroying the vessel wall. Always these vessels showed endothelial proliferation, sometimes so marked as to completely close the lumen. Occasionally the vascular endothelium was raised from its base by serous exudate.

On comparing the vascular changes with those in the subpleural layer it was seen that the morbid process was essentially the same, but that in the latter case the endothelial cells were not so numerous and did not form the typical aggregations.

FIG. 4.



High-power view of nodule shown in Fig. 3.

The nodules here described (Figs. 3 and 4) were exactly similar in structure, cell content, and situation to the Aschoff nodules found in the myocardium in acute rheumatic fever. No micro-organisms were demonstrated in the sections from the lungs. The microscopical appearances of the lung from Case 2 suggested a chronic stage of the lesion just described. The solid area in the cardiophrenic angle was composed of fibrous tissue, compressed alveoli with cubical epithelium, and areas of alveoli full of proliferated alveolar cells with remnants of mucosa from the smaller bronchi scattered here and there. The remaining bronchi were cystic and numerous cells were present in the walls, which were partially disintegrated. These cells were lymphocytes, plasma cells, and fibroblasts. Polymorph leucocytes were usually absent. The bronchial mucosa either formed a thick lining layer—often four cells deep—or the space was completely filled with mucosal cells. All of the vessels showed advanced endarteritis—often a solid cord only being left. In regions of the lung widely separated from the solid portion somewhat similar changes, but to a lessened degree, were observed. These changes consisted in cellular infiltration of the bronchial wall and some proliferation of the mucosal cells. There was also perivascular fibrosis and endarteritis. Here and there small groups of alveoli were filled with alveolar cells. No Aschoff nodules were observed in any of the areas. In suitably stained sections no micro-organisms were detected.

Conclusion and Summary.

From a histological study of the lungs from two cases of acute rheumatic fever it has been shown that there is a specific form of pneumonia which occurs during the course of acute rheumatic fever. This pneumonia may be accompanied by pleurisy. The lung lesion in its acute stage is a severe one and is characterised by vascular changes, proliferation, then necrosis, of alveolar cells, and destruction of the bronchi in the areas involved. It resembles in its general features an acute interstitial pneumonia. Typical Aschoff nodules are found in the interstitial tissue of the lung and are most prominent in the interlobular septa. These Aschoff nodules are usually found in close association with the smaller vessels. The condition may pass into a chronic or quiescent stage characterised by varying degrees of endarteritis, destruction of lung tissue, and fibrosis. In the chronic stage the Aschoff nodule is apparently absent.

I am indebted to my colleagues on the staff of the Bristol Royal Infirmary for the clinical histories of the cases.

ELEPHANTIASIS TREATED BY PROTEIN SHOCK.

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IN THE LANCET of Feb. 25th, 1928, Dr. W. E. Cooke, medical superintendent of the Hospital for Tropical Diseases, published a note on a case of early elephantiasis which we treated with protein shock.

The patient, a young woman of 26, was born and had lived most of her life in Madras. On a voyage home to England in 1927 her right leg became red, painful, and swollen, so when she arrived in London she came into the Hospital for Tropical Diseases. An examination there showed that the right leg was swollen below the knee, the œdema being of the solid type, and the glands in both groins were swollen, palpable, and tender. Apart from slightly enlarged tonsils on both sides nothing else abnormal was found. There was, however, an eosinophilia of 10 per cent.; the case was diagnosed as early filarial elephantiasis.

The treatment, T.A.B. injections intravenously, was given in February, 1927, and she left hospital on March 25th of the same year. After this she had a tonsillectomy performed. In May th[illegible] was quite satisfactory, with no signs of swelling, and in a letter Dr. Cooke received from her in August, 1927, she stated that she had been working hard and taking plenty of exercise but that there was still no sign of swelling in the leg. A further report written on Nov. 20th, 1927, from India, stated that she was travelling constantly as her work demanded and that, though she was not resting especially, the limb had shown no signs of swelling and measured the same as the other leg. We have not heard further since that date, so are unable to say whether the result is permanent.

As the result in this case has been promising, I have gone on trying protein therapy and have recently given it in a small series of similar cases. The following are the details.

CASE 1.—A married man of 60, with two children, complained of swelling of the right leg. He had been born in London and had once been in Paris 40 years ago, but otherwise never out of England. His family history was good and his use of alcohol and tobacco moderate. He had had measles, chicken-pox, mumps, scarlet fever, and two attacks of influenza, as well as having suffered from asthma for many years. In 1921 he fell off a bicycle and fractured his right clavicle.

In October, 1927, the right leg below the knee, for no apparent reason, became swollen. A doctor gave electrical massage for this, with the result that the leg quickly returned to normal. In June, 1928, there was another attack, the leg swelling up again and the temperature rising, and this time the thigh became involved as well. Massage was given but a certain amount of swelling remained below the knee when the acute attack had subsided. In October, 1928, another febrile attack occurred and the whole of the right leg became greatly swollen again. A series of six injections of collosol manganese, at weekly intervals, was given, but produced no appreciable result. In 1929 there were two further attacks, the last one being at the end of May. The patient was admitted to the Hospital for Tropical Diseases on June 6th, 1929. He looked thin but not emaciated. His teeth were fair; he had a plate in the upper jaw. The tonsil on the right side was enlarged and septic. The heart was normal and there were no signs of asthma in the lungs. Nothing abnormal was palpable in the abdomen, but the veins were prominent, especially over the right side. There was no enlargement of the liver or spleen. The right leg was much swollen both above and below the knee. There was no redness, but solid œdema—typical elephantiasis. The left leg was normal. The fæces, urine, and blood gave negative pathological reports and the Wassermann reaction was negative. X ray examination showed a few calcified glands in the left inguinal region. A diagnosis of elephantiasis nostras was made.

The patient was given a series of five T.A.B. inoculations intravenously at five-day intervals, the initial dose being 50 millions, increasing to 200 millions. He left hospital on August 13th, 1929, the leg being slightly better. He was told to report if anything further developed. He kept well until August 21st, when he vomited and had pyrexia, and the leg and glands became swollen and painful again. The attack lasted for two days. On Sept. 11th he had a further attack and was readmitted to hospital. A further T.A.B. inoculation of 200 millions was given. He left hospital again on Sept. 19th, 1929, and reported later by letter that he was no better.

CASE 2.—A married Indian woman of 37 with two children complained of permanent swelling of the left leg. She had been born and had lived in India all her life until May, 1929, when she came to England. Her father had died of dropsy and her mother had suffered from elephantiasis. She had had measles and dysentery. As a girl she had fallen from a balcony and injured her left ankle, being laid up for a month.

In 1909, when 17, she noticed that her left leg swelled below the knee every evening. A few months later she had an attack of ague and a swelling developed in her left groin. Her temperature was 103° F. and her whole leg became swollen, inflamed, and painful to touch. After three days these symptoms subsided. The attack, however, was followed by similar ones, and eventually a definite elephantoid condition developed. In 1912 she entered a local hospital, where she was treated with local applications and quinine therapy, the attacks subsequently being less frequent. In 1917 she again had severe attacks of lymphangitis and her leg was incised in several places on the supposition that pus was present, but nothing was found. In 1919 there was definite permanent thickening, and by this time the right leg was noticed to be swollen also. For the last ten years the condition has increased, recurrences of the febrile attacks taking place from time to time. The patient was admitted to the Hospital for Tropical Diseases to see if anything could be done for her. Her teeth were good and there was no enlargement of the tonsils or sign of oral sepsis. Her heart and lungs were normal. The liver and spleen were not enlarged and nothing abnormal was palpable. Vaginal and rectal examinations were negative. Both legs showed permanent swelling of the feet, ankles, and up to the knee, the left much more marked than the right—typical elephantiasis. The examination of fæces, urine, blood, and Wassermann reaction was negative, and no microfilariæ were found in the night blood. A diagnosis of filarial elephantiasis was made.

A series of five T.A.B. injections similar to those given in Case 1 was administered, but little reaction followed. She left hospital on August 14th, 1929, and was told to report in due course. She returned in October, reporting another attack of lymphangitis with increased swelling of the legs.

CASE 3.—A bachelor, aged 43, had attacks of pain and swelling across the dorsum of his right foot. He had been born in England and had resided in Sumatra in 1912, Seychelles and Uganda in 1919, and in India, Ceylon, Java, and Malaya in 1921. He had had inflammation of both lungs, measles, erysipelas of the legs, hæmoptysis in 1909, and in 1914 hyperpyrexia supposed to be due to sunstroke.

During 1924, whilst in Travancore, his right foot became swollen, his joints ached, and he had pyrexia. Since that time he had had repeated attacks of swelling in the same place, sometimes as often as every third week. Of the many and various treatments tried, salicylates alone seemed to have been effective in warding off a recurrence. Since his arrival in England in October, 1928, he had kept well except for a little tightness across the dorsum of the right foot. He was admitted to the Hospital for Tropical Diseases on Jan. 11th, 1929. The general examination was negative. No glands were found on deep palpation in his iliac fossæ. There was thickening of the tissues in Scarpa's triangle and over the proximal ends of the metatarsal bones of the right foot. A blood count showed: 5,100,000 red cells; 7200 white cells; hæmoglobin, 90 per cent.; polymorphonuclear leucocytes, 52 per cent.; lymphocytes, 43 per cent.; large mononuclear leucocytes, 2 per cent.; and eosinophils, 3 per cent. No parasites or filariæ were seen. The fæces, urine, and Wassermann reaction *yielded negative results*. X ray examinations failed to reveal calcified filariæ. A diagnosis of "recurrent lymphangitis ? filarial" was made.

The patient was given a series of five T.A.B. inoculations at five-day intervals. No further details are available. The patient promised to report by letter, but so far has not done so.

CASE 4.—A single man, aged 27, complained of swelling of his right leg and ankle. He had been born in Colombo, where he had lived most of the early part of his life. In 1910 he came to England, where he resided until 1925, and then went to India. He returned to England in 1929. He had had measles, chicken-pox, and gonorrhœa in 1927.

In 1927 he had two attacks of fever and pain, associated with swelling of his right leg from the ankle to the knee. He had had, before this first attack, some irritation of the skin of that foot. Both these attacks were diagnosed as lymphangitis. During 1928 there were four similar outbursts, each lasting four or five days. In April, 1929, he was admitted to the Hospital for Tropical Diseases to see if anything could be done for him. He was very stout; his pupils, throat, and tonsils were normal. His heart was a little rapid, but there was nothing wrong with his lungs. The liver and spleen were not enlarged and there were no enlarged lymphatic glands; the knee-jerks were normal. The right leg was swollen at the ankle, but this swelling largely disappeared with rest in bed. A blood count showed: 5,000,000 red cells; 8000 white cells; hæmoglobin, 90 per cent.; polymorphonuclear leucocytes, 61 per cent.; large mononuclear leucocytes, 2 per cent.; lymphocytes, 31 per cent.; eosinophils, 6 per cent. No parasites or embryonic filariæ were found. The urine, fæces, and Wassermann gave negative reactions. The urea content of the urine was 35·25 mg. per 100 c.cm. X ray examination yielded no evidence of calcified filariæ. A diagnosis of filarial lymphangitis was made.

He was given the usual course of intravenous T.A.B. injections; some of these caused severe reactions, his pulse-rate on one occasion rising to 160. He was discharged on May 24th, 1929. He reported on Oct. 23rd, 1929, that so far he had no recurrence of his attacks.

CASE 5.—A single man, aged 53, complained of attacks of swelling in both legs, especially the right. He had been born in England, but had gone to Japan in 1906, where he had been ever since. He had had measles, scarlet fever, and diphtheria; before the age of 16 he had had three epileptiform convulsions.

In 1916 he developed pyrexia with a swelling of his right leg below the knee. This quickly disappeared, but recurrences took place in 1927 and 1928, and in one of these he noticed that his left leg was swollen as well. On admission the right instep and left ankle were the most involved. His teeth were bad, but his tonsils were not enlarged. The left side of the chest was more prominent than the right, but no adventitious sounds were heard and nothing abnormal was found in the heart. His blood pressure was 100/65. The liver and spleen were not enlarged, but the sigmoid colon was just palpable and the groin glands on both sides were enlarged. There was no noticeable swelling of his legs—i.e., no permanent œdema. A blood count showed 4,820,000 red cells; 6000 white cells; hæmoglobin, 85 per cent.; polymorphonuclear leucocytes, 50 per cent.; large mononuclear leucocytes, 2 per cent.; lymphocytes, 47 per cent.; eosinophils, 1 per cent. No parasites, filarial or otherwise, were found. The urine, fæces, and Wassermann reaction were all negative. X ray examination of legs and abdomen gave no signs of calcified filariæ, but in the right leg there was evidence of calcification in the walls of the main arteries, and in the lower two-thirds a faint irregular opacity was seen, indicating scattered calcified deposits. A diagnosis of recurrent lymphangitis of uncertain cause was made.

He received the usual course of T.A.B. injections intravenously, and had good reactions. Reports of further progress are not yet to hand.

Recently F. W. O'Connor[1] has suggested giving injections of sulpharsphenamine locally to see if they would modify the severity and duration of attacks of lymphangitis believed to be filarial and of elephantoid fever. So far he believes they have some effect. It is too soon to speak with any certainty of protein shock by the intravenous T.A.B. injections. In Cases 1 and 2 no apparent benefit resulted; in Case 3 no recurrence has taken place up to date. On the whole, it is doubtful if such treatment will be of permanent benefit, but we have reported the cases in detail to let others try the method on a larger scale in the hope of obtaining some definite proof. Anything that would ameliorate this troublesome malady, even slightly, would be of the greatest value.

EXPERIENCES WITH THE DICK TEST.

HEAT-LABILE AND HEAT-STABLE CONSTITUENTS OF DICK TOXIN.

By

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The Dick Test and Susceptibility to Scarlet Fever.

THE Dick positive rate among 11,284 healthy Japanese in Dairen was 37·2 per cent., which corresponds with the rates obtained by Zingher[1] in New York, and Bókay[2] in Budapest. When the Dick-positive rate and the age-groups of 3000 scarlet fever patients were compared, the highest rate and the greatest number of cases were in the age-period 3 to 5 years; both rates gradually diminished with increasing age. While cases of infection of adults above 16 years of age averaged 4 per 1000, the rate of Dick-positive reactors remained at 13 per cent. The parallelism between the two rates which occurred at the earlier age-periods was no longer observed. We believe that the higher Dick-positive rate above the age of 16 years is due to the appearance in adults of an allergic response to the heat-stable constituent of Dick toxin (vide infra).

Females had a higher Dick-positive rate than males. Of 13,000 healthy Japanese examined, the female Dick-positive rate was 49·8 per cent., the male 34·6 per cent. Males, however, appear to have more opportunities for infection than females, for in spite of the discrepancy in the Dick-positive rates, approximately 50 per cent. of 3000 scarlet fever cases in the Japanese Hospital at Dairen were males. Chinese in Dairen had a much lower Dick-positive rate than Japanese (19·4 per cent. of 3376 tested instead of 37·3 per cent.). During the last six years the morbidity-rate per annum for Chinese has been only 0·08 per 1000; for Japanese 3·61 per 1000. From the returns reported for the last four years 17·7 per cent. of Dick-positive reactors have had a past history of scarlet fever. Two patients under our charge have had a second attack of scarlet fever, and one of these cases ended fatally. It is obvious, therefore, that infection with scarlet fever does not always give absolute immunity.

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[1] Porto Rico Jour. of Public Health and Trop. Med., 1929, v., 11.

In 305 cases of scarlet fever the result of a previous Dick test was known. Forty-one of these cases (14 per cent.) occurred in Dick-negative and 264 (86 per cent.) in Dick-positive reactors.

There is an interesting relationship between the size and intensity of the Dick reaction and the incidence of scarlet fever in a tested population. During the last four years among 4644 negative reactors the morbidity-rate was 4 per 1000; among 2540 very weak positive reactors 10 per 1000; among 2357 weak positive reactors 29 per 1000; among 1825 moderate positive reactors 54 per 1000; and among 551 strong positive reactors 76 per 1000. The occasional case of scarlet fever amongst the negative or very weak positive reactors cannot be explained away altogether by error in reading the Dick test. That such an error must occur from time to time is obvious when we consider the great variation in rate of development and intensity of positive Dick reactions and the fact that so often patients are only read once.

Ten of 43 Dick-positive reactors who were the hospital attendants of scarlet fever cases developed scarlet fever. On the other hand, there was no case of genuine scarlet fever among 157 Dick-negative hospital contacts. (Twenty-six cases occurred, however, which may be considered as "scarlatina sine eruptione," showing sore-throat as the only symptom.) Seventy-two of 115 primary school-children who had cases of scarlet fever at their homes were positive and six developed scarlet fever. No cases of infection were reported among 63 who were Dick-negative; from these facts a positive Dick test appears to indicate susceptibility to scarlet fever.

Generally speaking, the more intense the Dick reactions the more severe the case and the higher the percentage of complications. Among 14 strong positive reactors there were 29 per cent. of serious cases; among 37 positive reactors 13·5 per cent.; among 22 weak positive reactors 9 per cent.; while among 15 very weak positive or negative reactors no serious cases occurred. There was roughly three times the incidence of complications amongst strong positive reactors as in the Dick-negative group.

During the last four years 76 per cent. of 1380 cases and 13 per cent. of 2164 convalescents have been Dick-positive. In many early cases of the disease a bright rash makes a satisfactory reading of the Dick test impossible. Owing to an early attainment of immunity or, in more severe cases, to a temporary failure of the reacting power of the skin, the Dick positivity in the early stage of scarlet fever is not as high as might be expected. It is also difficult to explain the 6–13 per cent. of convalescents reported in the literature who do not become negative; this may be due to imperfect immunisation or to the appearance of allergy to the heat-stable constituent of the toxin which will be discussed in greater detail subsequently. As a general rule the Dick reaction changes in scarlet fever from positive to negative, but Dr. Kondo,[3] of the Komagome Hospital, Tokyo, has reported the reverse, and this again would apparently be due to the development of an allergic response to the heat-stable toxin. It has been our experience, in common with that of other investigators, that a positive Dick test and inability of the individual's serum to cause Schultz-Charlton blanching indicate susceptibility and a negative Dick test and positive Schultz-Charlton blanching indicate immunity.

Filtrates prepared from the staphylococcus, *Bacillus typhosus*, *B. tuberculosis*, pneumococcus, &c., have been shown to bear no relationship to infection with scarlet fever or its course.

From a consideration therefore of all experiences in Dairen since February, 1925, we are led to the conclusion that the Dick test is a reliable indicator of susceptibility to scarlet fever, the only exception being in those cases in which an allergic response develops to the heat-stable constituent of Dick toxin.

Defects of the Dick Test.

During the last four years we have had 209 cases of scarlet fever among 4733 Dick-positive reactors (44 per 1000) and 48 cases among 7186 Dick-negative reactors (7 per 1000). There is therefore no doubt about the practical value of the Dick test, although when we consider individual cases various questions remain to be answered.

(*a*) Why, when the morbidity from scarlet fever is so low in adults, does the rate of Dick-positive reactors remain above 13 per cent.?

(*b*) Why does the serum of an adult who is a positive reactor sometimes produce a positive Schultz-Charlton reaction?

(*c*) Why have only two of 2700 patients had a second attack of scarlet fever? From 16 to 33 per cent. of children who have had scarlet fever are Dick-positive.

(*d*) Why do some strong positive reactors become negative when a small immunising dose of toxin is given, while certain weak positive reactors, mostly adults, may remain weak positive or may even become stronger positive reactors after repeated immunising injections? When 40,000 S.T.D. are injected into a group of positive reactors, why do say 10–15 per cent. remain positive, although the serum of these positive reactors generally gives a positive Schultz-Charlton reaction?

(*e*) According to various published reports on the Dick test in scarlet fever, 10 to 30 per cent. of patients who are convalescent show a positive Dick reaction. The fact that the serum of many of these produces a positive blanching test cannot be overlooked. Giuffré[4] has observed 2 cases among 12 patients, Abramson[5] 7 among 182 patients, and Kondo[6] 80 cases among 101 patients in which a change in the *Dick reactions was observed during scarlet fever from negative* to positive. The serum of Dr. Kondo's patients produced positive Schultz-Charlton blanching. What has produced the positive Dick reaction?

(*f*) In performing skin neutralisation tests why is it that in some persons complete neutralisation is impossible in spite of an excess of antitoxin in the mixture injected?

(*g*) Why is it that Dick toxin which has been heated two hours at 100° C. is still capable of producing some reaction in certain persons whose serum is Schultz-Charlton positive?

Analyses of Dick Toxin.

The Dick toxin which we have heretofore used for the Dick test and preventive inoculation is a filtrate of scarlet fever streptococcus (Berkefeld W. or Chamberland F. B.) cultured for 4 to 7 days. Recently Ando (1929)[7] has shown that heat-labile and heat-stable constituents are present.

Heat-labile toxin:—To 1 litre of toxin prepared in 0·5 per cent. glucose bouillon, 2 litres of pure alcohol are added, the *mixture being left in the cold room overnight*. The precipitate is then diluted in 100 c.cm. normal saline solution, and the pH is adjusted to 4·0–4·2 by the addition of acetic acid. After 18 hours in the cold room the supernatant is poured off and twice the volume of alcohol added. The process is repeated on four occasions, the precipitate which forms after the operations being the heat-labile toxin.

Heat-stable toxin:—To 1 litre of toxin prepared in 0·5 per cent. glucose bouillon add 5 c.cm. of glacial acetic acid to make the pH 4·0–4·2. Centrifugalise. To the precipitate is added 200 c.cm. normal saline solution and 5 c.cm. N/20 caustic soda solution (the pH should now be about 7·2). The toxin is now one-fifth of its original volume, and may be diluted as required. The process is a difficult one, and the quantity obtained relatively small.

At this stage it is convenient to give the method of preparation of *bacterial endotoxin* (bacterial protein or nucleoprotein) which we think is of a similar nature to the heat-stable toxin.

The streptococcus is cultured for two days in 1 litre of 0·5 per cent. glucose bouillon. The organisms are then washed in normal saline solution, and 100 c.cm. of N/10 caustic soda added. After standing over night in the cold room and centrifugalising acetic acid (5·0 per cent. of 36 per cent. acid to each 100 c.cm. of N/10 soda) is added to the supernatant fluid, making the pH 4·0–4·2. The precipitate which forms is then dissolved in 10 c.cm. of alkaline saline solution.

Heat-labile toxin can be dried; the dry toxin is readily soluble in saline solution. We think that 0·1 c.cm. of 1/500 dilution of the reconstructed dry toxin corresponds to 1 skin test dose (S.T.D.) of the original filtrate. Heat-labile toxin can be inactivated by heating to 80° C. for half an hour. According to Dr. Ando 20 c.cm. will kill a rabbit with diarrhœa, and the toxin, injected intradermally, will cause a positive skin reaction in white pigs. In human subjects it is a true indicator of susceptibility and produces no allergic pseudo-reactions. When used for prophylactic inoculation it may produce in large doses the "scarlatinoid syndrome." The heat-labile toxin is readily neutralised by streptococcus antitoxin but not by anti-nucleoprotein serum.

Heat-stable toxin and streptococcus endotoxin are apparently qualitatively identical. The toxin is not destroyed by heating to 100° for half an hour. It is non-toxic for animals. According to our experiments 0·1 c.cm. of 1/800 dilution of the original endotoxin (concentrated to 10 times) is equivalent to 1 S.T.D. It is this toxin which gives rise to the allergic reactions which we have discussed earlier in this paper. If rabbits are immunised with streptococcus endotoxin, heat-stable toxin and streptococcus endotoxin may both cause flocculation at the same titre. The heat-stable toxin is therefore inferred to be the endotoxin.

Skin Reactions with Heat-labile and Heat-stable Toxins.

1241 subjects were injected in parallel with Dick toxin, heat-stable toxin, and heat-labile toxin and the results were as shown in the following table:—

Skin Reaction to Heat-stable, Heat-labile Toxins, and Dick Toxin (Streptococcus Culture Filtrate) on 1241 Persons.

Group.	Skin reaction to—			Degree of immunity.	Primary school-children.		152 actively immunised school-children.	205 persons with past history of scarlet fever.	190 Chinese coolies.
	Dick toxin (strept. culture filtrate).	Heat-stable toxin.	Heat-labile toxin.		330 of first year grade.	360 of second to sixth year grades.			
					%	%	%	%	%
1	+	−	+	−	39·4	23·3	0	3·4	8·2
2	+	+	+	±	9·4	5·0	0·7	8·8	5·7
3	+	+	−	+	11·2	11·7	13·2	13·2	12·9
4	−	+	−	+ +	17·6	21·1	44·8	29·3	14·9
5	−	−	−	+ + +	17·0	28·1	40·0	38·0	50·5
6	+	−	−		5·5	10·8	1·3	7·3	7·7

(Group 3 = Allergic reaction.)

The immunity of each group would appear to be as follows:—

Group 1. No immunity.
" 2. An intermediate type, showing the development of an imperfect immunity.
" 3 and 4. Immunity (in presence of allergy).
" 5. High immunity (without any allergy).

The sections of the table showing the results obtained with the heat-labile toxin are of special interest.

A study of these results has made us feel that many of the difficulties and discrepancies which all workers with the Dick test have experienced can be explained. If the heat-labile toxin is used for the Dick test the defects of the ordinary Dick test, which can be attributed to the heat-stable toxin contained in the Dick toxin, disappear to a great extent.

Immunisation with Heat-labile and Heat-stable Toxins.

Ten persons who were positive reactors to the heat-labile toxin were given five immunising injections of heat-labile toxin. Ten days after the last inoculation all were negative to skin tests performed with heat-labile, heat-stable, and ordinary Dick toxins. Thirteen subjects who were negative reactors received a similar course of inoculations and remained negative to the triple toxin test.

Fourteen persons who were positive reactors to heat-stable toxin were given five immunising injections of heat-labile toxin. Ten days after the last inoculation only 7 per cent. had become negative; 93 per cent. remained positive to the heat-stable toxin. The 7 per cent. of negatives may be due to the presence of traces of heat-stable toxin in the heat-labile toxin which was used for immunisation. Nine negative reactors received a similar course of inoculations with heat-labile toxin; 56 per cent. became positive to heat-stable toxin. This is difficult to explain except on the assumption that the trace of heat-stable toxin left in the heat-labile toxin which was used for five immunising injections produced allergy in the majority of cases.

Sixteen persons positive to Dick filtrate toxin received immunising injections of heat-labile toxin; 87 per cent. became negative; 13 per cent., like the 7 per cent. in the previous group, showed an allergic response. Seven persons originally negative to Dick filtrate toxin remained negative to the triple toxin test.

Immunisation with heat-stable toxin produced no immunity in most cases. In 21 per cent. of 14 cases positive to heat-labile toxin a negative response was given on re-test with heat-labile toxin. This may have been due to the presence of traces of heat-labile toxin in the heat-stable nucleoprotein used for immunisation. Six negative reactors remained negative on the completion of the injections. Four subjects positive to heat-stable toxin remained positive, and 31 per cent. of 16 subjects negative to heat-stable toxin became positive, an interesting result indicating the development of allergy to the heat-stable constituent. Fourteen persons positive to Dick filtrate toxin showed 58 per cent. of Dick-positives after immunisation, the 42 per cent. of "turn-overs" being ascribed to traces of heat-labile toxin. It is of interest, too, that 17 per cent. of 6 Dick-negative subjects developed an allergic positive reaction after the inoculations with heat-stable toxin.

Twenty-three subjects immunised with heat-labile toxin showed in no instance an increase in the size of the Dick reaction to heat-labile toxin or Dick toxin after immunisation; 35 per cent., however, showed an increase to heat-stable toxin. Of 20 subjects immunised with heat-stable toxin 5 per cent. showed an increased reaction to heat-labile toxin, 20 per cent. to heat-stable toxin, and 10 per cent. to ordinary Dick toxin.

Summarising this section, from the standpoint of immunisation, Dick toxin partakes much of the nature of heat-labile toxin. When a course of injections of heat-stable toxin is given, either there is no effect on the skin reaction to Dick toxin or an allergic skin response develops.

No allergic reaction to Dick toxin appears to be produced after immunisation with pure heat-labile toxin. Allergy may, however, develop in some cases when Dick toxin containing more or less heat-stable endotoxin is used for the immunisation.

Immunisation with Toxoid (Anatoxin).

We have prepared toxoid by the addition of 0·4 per cent. formalin to streptococcus culture filtrate and incubating at 40° C. for one month. Thirty-nine per cent. of 36 subjects remained positive after four inoculations. However, on re-test with heat-labile toxin, only 17 per cent. were positive, the other 22 per cent. of positive reactors on the first test having apparently been allergic in character. On a further re-test with heat-stable toxin 94 per cent. were positive showing a marked allergy. Allergy is most pronounced in subjects who have received a full course of inoculations; the greater the number of S.T.D. injected, the greater the allergic response. Toxoid immunisation appears to give a higher percentage of allergic reactions than does immunisation with raw toxin (streptococcus culture filtrate).

Some Practical Applications in Connexion with the Dick Test.

(*a*) *Selection of strains.*—A good toxin-producer is essential so that a high dilution of the filtrate may be used for the Dick test. Low dilutions of toxins contain a relatively greater amount of the heat-stable constituent.

(*b*) *Culture media.*—It is important to avoid blood, serum, or other protein. We ourselves use 0·5 per cent. glucose bouillon.

(*c*) *Preparation of Dick control.*—Owing to the difficulty of getting a satisfactory control to ordinary Dick toxin which contains both heat-labile and heat-stable constituents, the advisability of testing all patients with both heat-labile and heat-stable toxins is apparent.

(*d*) *When and how to judge results of Dick test.*—We have already referred to the wide differences which occur in the rate of development and course of a positive Dick reaction. In some cases when the reaction is seen 24 hours after inoculation it is fading, in others it is increasing. Parallel tests with Dick toxin, heat-stable toxin, and heat-labile toxin will help one in many cases to assess the susceptibility or immunity of the patient.

Summary.

1. Experiences with the Dick test and active immunisation against scarlet fever in Manchuria are described.

2. Tests have been performed with the heat-labile and heat-stable constituents of Dick toxin described by Ando.

3. If the heat-labile toxin is used instead of ordinary Dick toxin a number of the inconsistencies of the Dick test disappear.

References.

1. Zingher, A.: New York State Jour. of Med., 1925, xxiv., 915; Jour. Amer. Med. Assoc., 1924, lxxxiii., 432.
2. Bókay, J.: Deut. med. Woch., 1926, lii., 23.
3. Kondo, S.: Nineteenth Report from Isolation Hospital, Komagome, Tokyo, 1927.
4. Giuffré, M.: Pediatria, 1926, xxxiv., 393. Ref. Jour. Amer. Med. Assoc., 1926, lxxxvi., 1873.
5. Abramson, L.: Acta Pæd. 1927, vii., 138.
6. Kondo, S.: Loc. cit.
7. Ando, K.: Jour. Immun., 1929, xvii., 361.

Baby Week Challenge Shields.—The National Baby Week Council, which annually awards two silver challenge shields for the most effective local baby week campaigns, announces that the Lady Astor Shield, reserved for competition among the great towns, has been won for the second time by the Kettering U.D.C. Ladies' Voluntary Committee for Infant Welfare, while Northampton Maternity and Infant Welfare Voluntary Association secures the second place. The William Hardy Shield, reserved for smaller areas, has been won by the Welwyn Garden City Health Council. The Hill and Cakemore (Worcs.) Infant Welfare Centre was second.

The Cost of Motor Accidents.—At the annual meeting of the Western Infirmary, Glasgow, recently it was reported that in 12 months the treatment of injuries caused by road accidents cost the three large Glasgow hospitals over £10,000. The Western Infirmary alone, from Jan. 1st to Dec. 16th, 1929, treated 222 in-patients and 212 out-patients suffering from motor-car accidents. The in-door patients had a total residence in the hospital of 4344 days, equal to a cost of £1737; in addition, 204 in- and out-patients injured in omnibus and tramcar accidents were treated. These transport accidents cost the infirmary during the year £2336 for in-patients alone.

Clinical and Laboratory Notes.

THE CEREBRO-SPINAL FLUID IN TUBERCULOUS MENINGITIS IN ADULTS.

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Tuberculous meningitis in adults is not a common disease, and when it does occur is so often associated with obvious and previously recognised lesions elsewhere, especially in the lungs, that its diagnosis on clinical grounds is comparatively easy. Occasionally, however, it arises without such association, and must then be differentiated from other possible intracranial lesions. In this differentiation the cerebrospinal fluid (C.S.F.) is an important, and, as the following cases show, an almost infallible guide.

J. G. Greenfield states that most observers have failed to demonstrate tubercle bacilli in 60–70 per cent. of cases, but the records at Lambeth Hospital in the period covered by this series show that this figure can be greatly improved upon. In the 24 cases here reviewed, the C.S.F. was examined 32 times, and in all of these tubercle bacilli were found. In one case the first examination failed to show tubercle bacilli, but so convincing were the other features of the fluid that another specimen was obtained, and the bacilli were then easily found. Apart from the demonstration of the organisms, the general findings in the C.S.F. are of interest. The variations are wide, but when an average of the different results is taken, we get a picture of the C.S.F. in adult tuberculous meningitis as follows:—

Age.	Appearance of C.S.F.	Clot.	Protein.	Sugar.	Chlorides.	Cells per c.mm.	T.B.
Average Results.							
28	Clear.	+	0·27	Less than normal.	0·637	298	+
Variations Sometimes Found.							
15–60	Clear or yellow.*	+	0·1 to 0·6.	..	0·570 to 0·731.	31 to 984.	A few to abundant.

* Occasionally turbid.

From these figures it will be seen that the three factors of value in diagnosis are: (1) the presence of clot; (2) the level of the chlorides; and (3) the identification of the tubercle bacillus. The clot appears very soon after the fluid is withdrawn, but is best left undisturbed for 12–18 hours, by which time it is contracted, and can be handled more easily. It is a thin, delicate clot, usually suspended from the surface of the fluid or the side of the test-tube, and requires very careful handling. C.S.F. from patients with other diseases does also clot (the clot is indeed an indication of high protein level), but in no other pathological condition have I seen a clot with exactly the same characters.

Two separate samples of C.S.F. are always taken, and whenever there is any suggestion of meningitis, or where the cell count, which is done immediately the fluid is received, is more than 30 per c.mm., the tube is left entirely undisturbed until the next morning. If the condition is tuberculous the clot by that time will be sufficiently contracted to allow of examination. The test-tube is tilted, and with the platinum loop the clot is gently floated out on to a glass slide, allowing a little of the fluid to escape. The excess is taken up with blotting paper, and the slide is dried in the incubator. In transferring the clot to the slide it always tends to become twisted into a rather thin thread, which may be difficult to see through. The clot may also adhere to the loop, and practice is necessary to carry out the manœuvre correctly. I have often been indebted to the skill of my senior technician in handling a clot in which tubercle bacilli were very scanty.

When the clot is dried it is stained by the usual Ziehl-Neelsen method, and the organisms searched for. This may be a long process, and every part of the clot must be examined thoroughly before the search is given up. Twenty to forty minutes may be spent before a single organism is found. Five cases will illustrate how important the identification of the organism may be.

The Cases Described.

1. A. B. C., male, aged 60. Admitted March, 1923, with a history of head injury three days previously. Examination showed indefinite signs and probable neck rigidity. Lumbar puncture showed a clear C.S.F., in which cells numbered 122 per c.mm. On the fluid being set aside it clotted, and T.B. were found in the clot. Chlorides were 0·672 per cent. At post-mortem old and caseating lesions were found in both apices.

2. D. E. F., male, aged 17. Admitted with diagnosis of encephalitis lethargica. The patient had been ill for three weeks with sickness and headache. Signs were ambiguous, but the patient had a positive Kernig. The C.S.F. was straw coloured, and gave a count of 371 per c.mm. Cells showed 7 per cent. polymorphs and 93 per cent. round cells. A clot formed, and after prolonged search a few tubercle bacilli were found. Protein was 0·22 per cent. and chlorides 0·585 per cent. No autopsy was permitted.

3. G. H. I., female, aged 29, married. Had been in a sanatorium one year before admission, but signs were slight and sputum was never positive. Had been losing weight for four months. Headache was the first sign of the final illness, and persisted for ten days. Patient was admitted in semi-conscious condition. The C.S.F. was clear and clotted before reaching the laboratory. The clot showed 30 per cent. polymorphs and 70 per cent. lymphocytes, and search showed a few T.B. Next day the C.S.F. was again examined. It was very slightly turbid, and the cell count was 517 per c.mm. Protein was 0·2 per cent. and chlorides 0·630 per cent. Tubercle bacilli were very easily found. At autopsy a typical tuberculous meningitis was present, but no other definite lesion was found. The apex of the right lung was scarred, and histologically gave the picture of tuberculosis.

The remaining point of diagnostic importance is the level of the chlorides. The following case, which has already been mentioned, shows that this may be diagnostic.

4. Mrs. J., aged 31. Patient admitted Jan. 29th, 1928, after being feverish for one week. The examination of C.N.S. revealed no abnormality, except that the pupils were sluggish. Headache was persistent and lumbar puncture was done. The fluid clotted, but tubercle bacilli could not be found. Protein was 0·2 per cent. and chlorides 0·702 per cent. Cells were mainly round cells but a few polymorphs were present. A diagnosis of tuberculous meningitis was suggested. Next day the C.S.F. showed protein 0·12 per cent., chlorides 0·637 per cent. Tubercle bacilli could not be demonstrated as the clot was broken up. Nevertheless the diagnosis was considered definite, as the cells were few in number, and the chlorides were lower than is usual in any other condition. Two days later the C.S.F. gave: protein 0·15 per cent., chlorides 0·660 per cent. The clot showed both round cells and polymorphs and tubercle bacilli were easily found. No post-mortem was allowed, but in life no other evidence of tuberculosis was found.

5. Mrs. K. L., aged 20. Admitted July 29th, 1929, with diagnosis of lobar pneumonia. Had been ill 11 days, with cough and difficulty in breathing. Had fits at onset of illness, but no abnormality was noted in C.N.S. Three days later patient became drowsy, and complained of pain in the neck. The C.S.F. was sent to the laboratory without any indication of the diagnosis, and gave: protein 0·2 per cent., chlorides 0·614 per cent., cells 31 per c.mm. Here the chlorides were considered diagnostic, and the fluid was set aside. A very small clot formed, and was examined with great difficulty. A few tubercle bacilli were found after prolonged search. Three days later the C.S.F. chlorides were 0·601 per cent., and tubercle bacilli could be found easily. Four days later, a few hours before death, protein was 0·4 per cent., chlorides 0·601 per cent. Cells 984 per c.mm. and tubercle bacilli were abundant.

The protein is not of diagnostic value, but the relation between it and the cell count is. When the protein is high, yet the cell count is no more than 100–300 per c.mm., the diagnosis of tuberculous meningitis at once arises. Syphilitic lesions seldom show so many cells, while much higher counts are given by septic meningitis. The cells are usually predominatingly small lymphocytes, but polymorphs are always present, and may reach as much as 50 per cent.

All the cases here dealt with were fatal, and at autopsy tuberculous lesions apart from the meningitis were usually found, but the most common was a miliary tuberculosis, of which the meningitis was a concurrent part. In a few cases the other lesions were slight and unsuspected—e.g., a nodule in the kidney or the lungs. No case was found of tuberculoma of the brain, but in all the lesion was a typical tuberculous meningitis. It may be concluded, therefore, that in a C.S.F. showing a clot, chlorides near 0·640 per cent. and a cell count not too high, tubercle bacilli should usually be found and a diagnosis of tuberculous meningitis made.

I am indebted to my colleagues at Lambeth Hospital for the use of their notes on the above cases.

AN INHALED FOREIGN BODY EXTRUDED THROUGH THE CHEST WALL.

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Vincent Patrick, F.R.C.S. Eng.,
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It is unusual for a foreign body which enters the lung through the upper air passages to be spontaneously extruded through the chest wall. This was the fate of an ear of a common grass, resembling in appearance an unripe ear of barley, which was accidentally inhaled by a patient of ours. In former days small boys used to insert these grasses, stalk first, under the wrist of a jersey-sleeve, when the movements of the body acting on the stiff bristles of the grass would cause the ear to be propelled up the arm and to reappear in some distant situation. The modern small boy, however, does not appear to be content with this simple pastime; in Cannock, at least, a more dangerous game is played, one boy standing with open mouth while his playfellows aim grass-ears at the target so presented. In this case a well-aimed grass evidently passed into the upper aperture of the larynx, and by reason of the arrangement of its bristles passed inevitably onwards through the larynx, trachea, bronchi, lung, and chest wall.

The inhaled foreign body.

The patient, aged 3½, was sent into the Royal Hospital, Wolverhampton, by Dr. T. Hutchinson, of Cannock, on July 28th, 1929. About a month prior to admission he had taken part in this grass-throwing game, and shortly afterwards developed a persistent cough. For a fortnight before admission he had been ill at home, with a temperature ranging up to 103° F. On July 23rd he coughed up some blood, and a swelling developed on the chest wall in front of the angle of the right scapula. While dressing this swelling on July 28th the district nurse noticed what she took to be the end of a suture projecting from its centre. This she seized with forceps, and withdrew an ear of grass 1¾ inches long. The child was then sent into hospital.

On admission, and for the first three days, the child's condition remained fair, temperature 99°, pulse 110–120, respirations 28–32. The right base was dull on percussion, and the breath sounds were much diminished. There was a small sinus over the eighth intercostal space on the right side in the posterior axillary line, from which there was a slight purulent discharge. This pus showed a mixed infection, including streptococci, pneumococci, and *M. catarrhalis.* A radiogram showed increased density at the right base; but exploration with a needle withdrew no fluid. On July 31st he suddenly had a bad fit of coughing, and brought up about a pint of exceedingly foul pus; this left him very collapsed, and for the next three days he was very ill indeed, the pulse ranging from 140–160, respirations 40–48, and temperature up to 102°. During this period camphor and other stimulants were employed hypodermically, and the chest aspirated again without result. On August 4th he was a little better, temperature 99°, pulse 136, and respirations 32, and an injection of lipiodol was made through the small sinus to determine if possible the extent of the abscess cavity in the chest. A radiogram showed globules of lipiodol resting on the upper surface of the diaphragm and that none had entered the lung substance. It was deduced from this that the lung was not adherent to the chest wall, and that most of the pus was in the pleura, and not in an abscess of the lung as had been suspected. Accordingly the same evening a portion of the ninth rib was resected under local anæsthesia, and the empyema drained. The temperature fell rapidly to normal.

The child made a steady recovery; the tube was removed on Sept. 5th, and the child went to a convalescent home on Sept. 9th. Seen as an out-patient on Nov. 9th he seemed very well but there was still a little discharge from the wound; a month later the wound was completely healed.

ORIENTAL SORE TREATED BY BERBERINE SULPHATE.

AN ANALYSIS OF FIFTY CASES.

By P. V. Karamchandani, M.B. (I.M.S., Retd.).

In a previous paper [1] I welcomed berberine sulphate as a remedy which deserved to be universally tried. I propose now to give the results of further trials with berberine sulphate in Oriental sore during the last two years.

Fifty cases of Oriental sore, multiple as well as isolated, were treated between Dec. 16th, 1927, and July 19th, 1929. Hypertonic and isotonic saline dressings were not applied. In some cases the injections were given twice a week to see whether bi-weekly injections had any effect in shortening the course of disease, and also if any untoward effects occurred locally. It was found that they had no advantage over the weekly ones, nor were any untoward effects noticed.

The average period of cure per case worked out at little more than 17 days, and the average number of injections at three. If injections had been given at weekly intervals the latter figure would have been much lower. Even these figures in my opinion compare favourably with the results achieved by the use of intravenous tartar emetic. I have come to the conclusion that in berberine sulphate we have a better drug than tartar emetic for isolated sores. Of course, for multiple sores treatment by berberine sulphate is rather tedious. My earlier limited experience has, however, been modified in one respect—viz., that an injection affects sores over an area of about three square inches. The effect of the drug, I now find, is purely local.

The following points are worthy of consideration: (1) The drug should be fresh, because it seems to lose potency with age. (2) The solution should be prepared fresh each time for immediate use and prepared solutions should not be kept in stock. (3) Hypertonic and isotonic saline solution dressings are very strongly recommended in conjunction with the injections. (4) No untoward effect whatsoever has been noticed from the use of the drug. (5) A dose of one-third of a grain, instead of one-quarter of a grain, in 1·5 c.cm. has been found to give better results.

A CASE OF PURPURA HÆMORRHAGICA ASSOCIATED WITH SCARLATINA BENIGNA.

By Laura Trewby, L.R.C.P. & S. Edin.,
ASSISTANT MEDICAL OFFICER, LEEDS CITY HOSPITAL.

The patient, a girl, aged 18 years, was admitted to the City Hospital, Leeds, on Oct. 4th, 1929, suffering from scarlet fever. She looked healthy. There was no history of rheumatism, and nothing abnormal in the family history; she had had measles and whooping-cough in infancy.

She was admitted on the fourth day of the disease, and appeared to have a typical attack of scarlatina benigna. The symptoms included a temperature of 102·4° F. on admission, a moderately well-developed punctate erythema, moderately injected throat with rather large tonsils, some follicular deposit being present, no adenitis, and a faint trace of albuminuria on the day of admission only. The heart and lungs appeared normal. On the sixth day she complained of slight rheumatic pains about the shoulders. This passed off within a few days. Desquamation occurred on the twelfth day of the disease. As her progress appeared to be satisfactory, she was allowed up on the 22nd day, but had to return to bed, as she vomited twice and developed a temperature of 99·6°. On the 23rd day she complained of rheumatic pains which attacked successively her hands, right elbow, left foot, back, left elbow, and left knee. This continued during the 24th day. The joints appeared to be swollen. On the 25th day the pains were easier, but the swelling persisted. Patches of purplish staining appeared on the trunk and extremities. There was a complete left and a partial right subconjunctival ecchymosis. The temperature reached 101·4° at this stage. It was suspected that the joint condition was due to effusion of blood. On the 26th day fresh purpuric areas appeared. One involved the left anterior quadrant of the tongue and formed a rather prominent swelling. In the course of the forenoon bleeding developed from the mucous membranes of the mouth. By midday she became very restless, flinging herself about the bed. Semi-consciousness followed and death ensued at 8 P.M. An autopsy was not permitted.

C. B. Ker states that he had only seen a few cases of purpura hæmorrhagica, and these in septic cases, and usually supervening in the third week. J. D. Rolleston and others have described cases of a rapidly fatal type of the disease known as purpura fulminans, in which the ecchymoses are large and inflammatory, and in which no bleeding from the mucous membranes occurs. J. J. Phelan has reported a case of purpura fulminans occurring in scarlatina benigna, and states that in the literature he can find no definite evidence of a similar case.

The case reported differs from Phelan's case in two particulars, the less rapid course and the terminal development of hæmorrhages from the mucous membranes.

I am indebted to Dr. J. S. Anderson, medical superintendent of the Leeds City Hospitals, for permission to place this case on record.

King George Hospital, Ilford.—This proposed hospital, which will serve the population, amounting to 50,000, of Ilford, Barking, Becontree, Dagenham, and Manor Park, will take the form of an enlargement of Ilford Emergency Hospital from 70 to 300 beds. The Prince of Wales pointed out that with the exception of this small institution there is no voluntary hospital along Thames-side between Barking and Tilbury, and it was mainly to include this area that five years ago the orbit of the King's Fund was extended from 9 miles round Charing Cross to 11 miles round St. Paul's. That Fund has already made a grant of £10,000 out of the Wells legacies, and has now granted a further £10,000 from the Thank-offering Fund. With £2000 for the extension of the old building and £2000 from the ordinary distribution for 1929, the King's Fund has thus provided a total of £24,000. The Ford Motor Company, which has a factory site at Dagenham, has given £5000, Mr. Henry Ford and his son, Mr. Edsel Ford, have each contributed £2000, and Sir Percival Perry, the chairman of the company, £1000.

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[1] Indian Medical Gazette, October, 1927, lxii.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTIONS OF TROPICAL MEDICINE AND PATHOLOGY.

TROPICAL DISEASES ARISING FROM DIETETIC DEFICIENCY.

A COMBINED meeting of these Sections was held on Jan. 7th, when the chair was occupied by Prof. J. B. CHRISTOPHERSON, President of the Section of Tropical Medicine.

Prof. J. W. B. MAGAW said there were three main forms of dietetic deficiency in the tropics: first, shortage of food as a whole; secondly, shortage of available proteins; thirdly, shortage of vitamins. Many millions of the inhabitants of tropical countries lived on the borderline of starvation, and when harvests were bad many suffered from actual starvation. The problem, in a broad way, therefore became one of adjustment of the population to the food supply. It should be emphasised that research workers could do little to improve the conditions of human existence so long as these efforts were nullified by a progressive increase in population. The well-being of the human race must depend on four supports: (1) the production of food and other necessities; (2) the control of reproduction; (3) the prevention of disease; (4) the maintenance of security. Most of the people in the tropics lived short of proteins. Mackay had found but little deficiency of vitamins in the diets which he investigated, and had considered that if there were adequate protein in the food the vitamins would take care of themselves to such an extent that their apparent shortage would not be a serious problem. The subject of vitamin B deficiency was sufficient to fill an evening's discussion. He did not agree with those workers who said that beri-beri was caused by a deficiency in the diet of vitamin B, or that all other theories of the causation of that disease had died a natural death. Some workers denied that deficiency could account for outbreaks of the disease which they had studied. Many believed there was a factor in addition to avitaminosis. In the Far East beri-beri was strikingly associated with a diet of over-milled rice, and peripheral neuritis was a notable feature. Fowls and other winged creatures developed this neuritis, and it could be cured or prevented by giving vitamin B. Beri-beri in humans living on over-milled rice could be cured or controlled by the substitution of par-boiled rice. Attempts had been made to reproduce beri-beri in human beings, using volunteers from among the jail population in the Philippines. These experiments showed that a monotonous diet which was poor in calories, in available proteins and in vitamin B, caused a vitamin disturbance which was suggestive of beri-beri. It was found difficult to devise a diet lacking in vitamin B, but satisfactory in all other ways. There was really very little reliable evidence of a uniform association between human beri-beri and vitamin deficiency. Prof. Magaw went on to describe several outbreaks of epidemic dropsy. Two authorities were unable to exclude this disease from the beri-beri group. It often appeared as an explosive outbreak among people who were living on the same diet as usual; there was no reason for regarding this disease as an avitaminosis. Beri-beri was a name which had been used for many years to designate certain disease manifestations, mostly associated with the use of a rice which had been stored for a long time after manufacture. There might be two or more diseases in the beri-beri group, but they had not yet been differentiated with certainty. Probably one of those diseases was caused by a poison which was formed in rice stored in damp and hot rooms. He admitted that some of the diseases entitled to be included in the group were due to a deficiency, chiefly of vitamin B. An attempt ought to be made to differentiate the diseases in the group; one should not be satisfied with a hypothesis which invoked several causes for a single disease. He did not accept the idea of endocrine deficiency as a satisfactory explanation of any disease. If endocrine glands were deficient, the question to be answered was why they had become disordered. Probably the endocrine deficiency was an effect, not a cause. Practitioners need not be depressed because causation of beri-beri was still obscure; their duty was clear—namely, to cut out rice from the diet, so ensuring that poisons residing in rice were eliminated; and to ensure that the diet was nourishing and that it included vitamin B.

Dr. G. MARSHALL FINDLAY said it was possible to produce various types of inanition. One was the quantitative type, in which all the known factors were present in the diet, in complete or incomplete amounts. Qualitative deficiencies, however, were the most important, and the lack of certain amino-acids was most important of all. The aromatic amino-acids seemed to be essential in the diet. In the course of a review of our present knowledge, Dr. Findlay said that if rats were placed on a complete diet, except that the sole source of protein was represented by dried egg white, they developed dermatitis, the hair fell out, and they had a kangaroo-like attitude when they walked. The pathological changes were identical with those seen in children with "pink disease," but never older than 3½ years. The condition known as hunger œdema, seen, for instance, in Russia in 1921, had never been produced in animals, but was probably due to protein deficiency. Epidemic dropsy seemed to occur only in rice-eaters, whereas beri-beri often occurred in those who had never eaten rice, but suffered from a deficiency of vitamin B1. In association with epidemic dropsy there was often an acute exanthematous rash, and also glaucoma, which had not been described in association with true beri-beri. The changes in an early condition of pellagra, said Dr. Findlay, were described as a degeneration of the cells of the central nervous system, and a collection of lipoid pigment in the cells; but the degenerative changes in the cord were not usually found in human pellagra until the condition was very marked.

Discussion.

Dr. H. B. DAY said that pellagra bore the same relation to the consumption of maize as beri-beri did to the consumption of rice. No one had succeeded in transmitting pellagra. One of its earliest symptoms was diarrhœa, but unless there was a complicating infection there was nothing characteristic about the stools. The cause of pellagra, he thought, was something which was related to nutrition, chiefly of the ectodermal structures. The problem in man and in animals was not the same. It had been suggested that with a larger protein consumption, more vitamin B was required than when the protein was cut down to a minimum. That might explain the vagaries met with in the condition.

Dr. G. W. BRAY gave the meeting his experiences in the mandated islands of the Pacific bordering on New Guinea. Here infantile beri-beri was very rife, and the mortality among the newly born was about 50 per cent. The native population did not eat rice, but lived on fish and native fruits. Fermented liquors were denied them. The cases were formerly diagnosed as stomach trouble, marasmus, broncho-pneumonia, &c. Death usually took place from the ninth to the twelfth week after birth, the death-rate being least when the rainfall was heaviest. Infants, apparently well, would suddenly vomit, scream, and die within five minutes. In most of the cases the illness did not last longer than 24 hours. The yeast found in the sap of the coconut palm was found to cure this condition, and the infantile mortality, which formerly was 400 per 1000, was now about 70, or little more than in England. It was the custom of the mothers at the time of the birth to eat very little but to drink a good deal of sugared water. Neither white flour nor polished rice was allowed to be sold now, and the drinking of so much sugar-water was discouraged.

Dr. Tertius Clarke said that the disease he encountered in Malaya was true beri-beri, but that in India was not. When par-boiled rice was substituted for the polished kind the disease ceased.

Dr. W. R. Aykroyd spoke of beri-beri among the inhabitants of Newfoundland and Labrador, who were living on staple white flour. The beri-beri seen there was associated with polyneuritis, myocarditis, and occasionally with œdema, and it occurred in people who were living in conditions of marked malnutrition —people who for months were confined practically to refined white-flour bread, with a small addition of salt meat or fish and some molasses. When a better diet was available the cases decreased in number. In these regions there seemed to be a close relation of the disease to absence or deficiency of vitamin B 1.

Dr. Hugh Stannus suggested that besides some deficiency there was operative some active factor in the diseases such as beri-beri, though its action was masked. The onset of rickets could be materially helped by giving large quantities of oatmeal. He would like to know whether various species of animals made use of different amino-acids, or were they common to all species?

Dr. Kingston Barton asked why the infants in Polynesia, who continued to be breast-fed for many months, failed so soon. Owing to the continuation of practical starvation of the mother probably her milk was at fault.

Dr. G. W. Theobald said he came from Siam, where it was impossible to knock the patient off rice. His patients were pregnant women, who in every case had beri-beri of the dry type. Their diet was not altered, except to substitute unpolished for polished rice, and they got well. He had seen some of Colonel McCarrison's pigeons, and he did not see much difference between the polyneuritis of those pigeons and the dry beri-beri of his own patients. The result of the white man's incursion into Siam was that rice was polished solely for the European market. Three years ago a congress under the auspices of the League of Nations was held in Singapore to try to stop this polishing, but the Government opposed, saying that unless the rice were polished there would be no market for it in London. Therefore the industry was still flourishing.

Replies.

Prof. Magaw, in reply, said it would not be a surprise to learn that a toxin was excreted in the mother's milk in the cases referred to by Dr. Bray. Glaucoma occurred in epidemic dropsy, but not in beri-beri, though the French called attention to a scintillation of the eyes and a dimness of vision associated with the latter disease. Epidemic dropsy was usually explosive, but not always. It was always difficult to get a sample of the actual rice implicated in an outbreak, for when inquiry was made the dealer took fright and disposed of the rice elsewhere. In the larger proportion of cases pellagra occurred among maize-eaters. The behaviour of beri-beri suggested the activity of an irritant toxin which entered the body through the gastro-intestinal mucous membrane.

Dr. Findlay, in reply, said that when scurvy was experimentally produced in utero the mother might not be suffering from the disease; and he thought it was safer in the conditions now being discussed to assume there was a deficiency which was affecting the mother to a slight extent, but was shown definitely in the infants. The dimness of vision, &c., in beri-beri suggested deficiency in vitamin A, since such deficiency caused night-blindness and other conditions of the kind. There was much evidence that absence of vitamin B 1 interfered with the metabolism of the organism in a number of ways.

The Chairman said his own experience of tropical disease was in the Soudan, where there was practically no pellagra at all, though in the contiguous country of Egypt it was one of the most serious of the national diseases. In the Soudan millet was the staple food, while in Egypt the food was maize. Much still remained to be learned concerning both pellagra and beri-beri, and when India and Egypt attained to the larger measure of independence at which they were striving he hoped the researches so carefully made would be continued, to the benefit of their population.

PATHOLOGICAL SOCIETY
OF GREAT BRITAIN AND IRELAND.

A meeting was held on Jan. 3rd and 4th in the Bland-Sutton Institute at the Middlesex Hospital, Prof. J. McIntosh in the chair.

F. W. Andrewes (London) pointed out that the immediately preceding cultural conditions might greatly influence the agglutinability of hæmolytic streptococci.—C. E. Dukes (London) gave an account of several cases of polyposis intestini with their family trees, showing that the condition is familial, inherited apparently as a mendelian dominant, more frequent in males than females, and ending in carcinoma in two-thirds of the cases unless prophylactic excision of the large bowel has been done.—J. H. Teacher (Glasgow) showed a specimen of carcinoma of the gall-bladder from which about 100 secondaries had been implanted in the mucosa of the intestine though embolic dissemination with specific localisation could not be excluded; there was widespread lymphatic metastasis. —E. H. Kettle (London) described a case which broke the rule that chronic ulcer of the duodenum never leads to cancer.—W. Cramer (London) had tried a great variety of experiments to look for evidence that mouse carcinoma or sarcoma was transmissible without living cells; some of the results, especially with sarcoma, were suggestive, but none conclusive that this might sometimes happen.—T. Lumsden (London) had had an American strain of mice (which in Buffalo develop carcinoma of breast in 94 per cent. of the females), without obtaining any such excess of tumours; he described also a number of observations on the subcutaneous nematodes of mice.—Helen Chambers and Gladwys Scott (London) summarised their experience of many years in the propagation of the Jensen rat sarcoma; the young born of animals in which the tumour had spontaneously regressed were more resistant than usual.—F. C. Happold (Leeds) discussed the correlation of the oxidation of certain phenols and dimethylparaphenylenediamine by certain bacteria.—J. B. Duguid, Marjorie Duggan, and J. Gough (Cardiff) had endeavoured to produce arterial degeneration by giving excessive quantities of irradiated ergosterol by the mouth. Little effect was obtained in rabbits, more in cats; in rats, abundant calcification was obtained if they were fed on a vitamin-free diet, with or without the addition of cod-liver oil and marmite, but not if they received an ordinary mixed diet. Calcification was preceded by degeneration. Cramer and Cameron had obtained similar results.—M. J. Stewart (Leeds) found that the "curious bodies" of human pulmonary asbestosis could be produced in guinea-pigs by the subcutaneous inoculation of asbestos dust, the fibres acquiring the characteristic nodular accretions.—S. L. Cummins and A. F. Sladden (Cardiff) showed the importance of estimating the amount of silica in the lungs of coal-miners suffering from pulmonary fibrosis.—J. G. Greenfield (London) described the changes in the central nervous system in two cases of encephalomyelitis following mild febrile illness ("influenza") one fatal after four days from broncho-pneumonia, the other after seven weeks from cystitis. Perivascular demyelination was very marked.—J. McIntosh (London) maintained that the characteristic histological change in vaccinal encephalitis (rabbits) was an endothelial, not a lymphocytic, reaction, and that in this way the disease differed from post-vaccinal encephalitis in man. Hurst said that his experience in monkeys bore this out.—W. M.

Crofton (Dublin) said that he had isolated a small Gram-negative bacillus (possibly the same as that obtained by Copeman many years ago) from vaccine lymph and cases of small-pox and that vaccination with it protected rabbits against vaccinia.—R. W. Fairbrother (London) prepared a serum in horses by massive dosing with the brain-tissue of monkeys experimentally injected with poliomyelitis, and found that it had a definite, but low, power of neutralising the virus.—G. S. Wilson (London) described four races of *Bacillus aertrycke* isolated from one culture, which showed permanent differences in colonial form, morphology, agglutinability, and virulence. In shape they varied from long filamentous bacilli to short coccoid forms.—W. Mair (London) discussed the difficulties and discrepancies of testing the virulence of diphtheria cultures, and maintained that they could not satisfactorily be divided into virulent and avirulent; the existence of intermediate slightly virulent stains had to be recognised.—H. J. Parish and C. C. Okell (London) had found that young rabbits were less susceptible than larger animals to the scarlet fever streptococcus and its toxin.—Muriel Robertson and A. Felix (London) by inoculation with heated bacilli prepared an anti-vibrion-septique serum, which had no antitoxic power, but a considerable capacity of preventing death in animals inoculated with spores *plus* calcium chloride as an activator; unlike the antitoxin, this antibacterial power is type specific.—D. Nabarro and A. G. Signy (London) reviewed a year's experience with dysentery infections at Great Ormond-street Hospital; Flexner Z and Sonne bacilli were isolated many times; a considerable proportion of the cases contracted infection while in hospital.—S. Ellingworth, F. C. Happold, J. W. McLeod, and D. P. Priestley (Leeds) showed that the gonococcus could be isolated from the female genital tract more certainly by using media which had not been heated much during preparation, and by using the tetramethyl method of distinguishing the colonies.—Juliette Marchal (London) demonstrated a new virus disease of mice causing lesions on the feet and in the viscera.—F. T. Grey (London) showed his colour-index ratiometer and proteinometer.—D. H. Patey, R. W. Scarff, and S. L. Baker (London) showed various pathological specimens and a series of breast carcinoma correlating histological structure and malignancy.—H. J. B. Fry (London) showed lymphadenomatous ulceration of the intestine, and J. S. Dunn (Manchester) the infiltration of squamous epithelium by mucous carcinoma.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.

A MEETING was held on Jan. 2nd, Dr. W. BARRINGTON PROWSE, the President, in the chair.

Mr. J. R. GRIFFITH read a paper entitled

The Technique of Local Anæsthesia.

He said that he uses Labat's syringe and needles and Corbiere's neocaine, and then described the methods that he uses for anæsthetising the upper arm in out-patients and in-patients. He anæsthetised the fingers by blocking the digital nerves at the webs, infiltrating the dorsal aspect of the finger at the same time in order to cut off the radial branches. The hand was anæsthetised by infiltrating the median and ulnar nerve at the wrist, and by making a ring of infiltration in the skin round the wrist in order to cut off the superficial fibres running in the subcutaneous tissues to the hand. In dealing with Colles' fracture, Mr. Griffith said that he had found local infiltration round the site of the fracture unsatisfactory. Brachial plexus block requiring too long a wait, he now relied on blocking the ulnar, median, musculospiral, and musculocutaneous at the elbow, at the same time blocking the superficial nerves with a ring of infiltration at the same level. The technique of brachial plexus block was then described. By this method the whole arm was anæsthetised except a small area in the axillary part supplied by the intercosto-humeral. The brachial plexus consisted of a number of thick, tough nerves, and required a large amount of 2 per cent. solution to soak through to the deeper fibres. It was important, therefore, to distribute the fluid throughout the whole length of the plexus. The injection was made in three places through a single puncture which was situated 1 cm. above the middle of the clavicle. The first injection was made where the cords cross the first rib; the second was made at the origin of the roots from the intervertebral foramina; and the third injection was made below the level of the first rib, where the nerves separate from the cords. All these injections could be very quickly and easily carried out; several patients could be injected one after the other and their treatment carried out in turn. Both the preparation for and the recovery from general anæsthesia was avoided, and the patient was able to return home without discomfort. The anæsthesia gave plenty of time, and the very perfect muscular relaxation that was obtained made the reduction of fractures and dislocations comparatively easy. At the same time the patient was able to coöperate. For instance, the patient with fracture of the neck of the humerus could sit on a stool while the arm was fixed in abduction with plaster-of-Paris. Where the injury was of the hand and fingers, the patient could voluntarily move the joints, showing whether the mechanical disability had been completely overcome.

Mr. Griffith then described the method of local infiltration and field block, stressing the importance of systematically infiltrating the whole thickness of the tissues.

The method of anæsthetising the maxilla and the tongue used for patients was described. This consisted in the infiltration respectively of the tissues in the sphenomaxillary fossa, and of those in proximity to the inferior maxillary division of the fifth nerve. Mr. Griffith pointed out that this anæsthesia was comparatively easy to induce, since the solution had only to be placed near to the nerve. For operations on the tongue the glossopharyngeal nerve was blocked by infiltrating the back of the tongue through a puncture above the symphysis of the hyoid bone. Mr. Griffith thought that this technique would prove very useful when radium needles were used, for it did away with the discomforts and dangers associated with recovery from general anæsthesia. Rib-resection under local anæsthesia was then described and its advantages stressed. The technique of paravertebral block associated with splanchnic block was demonstrated, the splanchnic block being carried out from behind. The perfect relaxation that this procedure gave was of the greatest assistance, but Mr. Griffith admitted that he had usually to rely on his anæsthetist to relieve the patient from pain, although only a very small quantity of anæsthetic was necessary as a rule. In dealing with the lower abdomen, pelvis, and legs he used intrathecal block, the main disadvantage of which he found to be the shortness of the anæsthesia. In concluding his paper, Mr. Griffith dealt with the technique of caudal block, and insisted on the importance of using a large quantity of fluid, and also of making certain that the needle was actually in the spinal canal.

A film illustrating the technique of Mr. Waugh's operation for tonsil enucleation was then shown. The film had been specially taken by a representative of the Kodak Company at the Children's Hospital, Brighton. It showed the details of the operation, and included diagrams showing the blood-supply of the tonsil.

MANCHESTER'S ARTIFICIAL SUN.—The first public artificial sunray centre in Manchester has been opened at the Whitworth Baths, Ashton Old-road, Openshaw, by the Bath Committee of the corporation. Three quartz lamps have been installed and will be operated by specially trained attendants. The cost of the treatment will be 2*s.* for one bath, 4*s.* 6*d.* for three, and 7*s.* 6*d.* for a course of six.

Reviews and Notices of Books.

RICKETS, OSTEOMALACIA, AND TETANY.

By ALFRED F. HESS, M.D. New York. London: Henry Kimpton. 1930. Pp. 429. 25*s.*

THE publication of a really comprehensive treatise on rickets is an event, and no one could have been more competent to undertake this arduous task than Prof. Hess. The volume which he has produced will be of the greatest importance in medical literature, and will interest and instruct a wide circle of readers. The whole story of rickets is taken up from the earliest evidence of its existence, and traced throughout the history of medicine up to the present day. In his historical survey the author has been at pains to do justice to the contribution of Daniel Whistler, which he considers to have been somewhat unfairly depreciated by many writers on the history of medicine. In a chapter on the geographical distribution of rickets the conflicting evidence adduced from various countries is reviewed; Prof. Hess concludes that while no country is devoid of rickets, its incidence corresponds in general to the countries deficient in sunlight, subject to some qualifying influences, such as industrialism. The experimental induction of rickets in animals is described shortly in a special chapter, but is frequently referred to in later sections; the ætiological factors are discussed fully in one of the most attractive chapters in the book. Prof. Hess believes that heredity is at the most a minor factor seldom operative, but that a constitutional predisposition to the disease does exist. His summary of the question is that the dominant factor is sunlight; that the dietetic factor is important, and is as yet but imperfectly understood; and that the growth-rate is a factor of importance which must be regarded as determining as well as predisposing. The section on metabolism in rickets will be of exceptional value as a guide to a voluminous literature.

Prof. Hess emphasises the reserve with which the results of chemical experiments must be accepted, and doubts whether the pathogenesis will be solved by these means; but he has greater hopes of those studies which include the organic constituents of the tissues. The chapters on pathology and symptomatology are mainly descriptive, and contain admirable illustrations. In discussing diagnosis, stress is laid on the caution which should be observed in accepting craniotabes as evidence of rickets. The chapters on osteomalacia and tetany deal with the clinical features and biochemical characteristics of these disorders, and also their relation to rickets. Of particular interest is the author's account of the pathogenesis of tetany, and the conflict of opinion on the significance of total and ionised calcium values. While convinced that a true (uncompensated) alkalosis does not occur, he admits that a trend in the direction of alkalosis tends to the induction of tetany. There is a comprehensive bibliography, arranged in correspondence with the chapters, and this adds greatly to its value.

The volume contains considerably more material than might appear from its size, for it is closely printed. One of its most admirable features is the balanced and impartial manner in which divergent views are depicted, and the fairness with which Prof. Hess has presented opinions not his own. The work will be found essential to all who are studying the subject, and must occupy an important place in the literature of pædiatrics.

THE CEREBRO-SPINAL FLUID.

Le Liquide céphalo-rachidien. By Dr. RISER, Professeur agrégé à la faculté de Toulouse. Paris: Masson et Cie. 1929. Pp. 250. Fr.28.

THIS monograph deals with the physio-pathology of the subarachnoid and ventricular spaces, and is largely a critical review of the new methods of exploration of these spaces by injections of air, coloured substances, and lipiodol. Of this aspect of the cerebro-spinal fluid the Toulouse school, under the leadership of Prof. Cestan, has made a special study, and Riser's book is largely based on this work. The results of experiments and observations undertaken at Toulouse have almost entirely confirmed the work of the American physiologists, but have also amplified this in several ways. Thus it has been found that absorption of cerebro-spinal fluid in man takes place, not only by the arachnoidal villi, but through the walls of all the cerebro-spinal veins. Riser has also confirmed in man the observation that there is practically no absorption by the perineural lymphatics. Another point in human physiology which seems to be new is his manometric observation of the rate at which the cerebro-spinal fluid is normally secreted. In the majority of subjects he found that if, after recording the pressure, 20 to 30 c.cm. of cerebro-spinal fluid were drawn off it took from two to three hours for the pressure to be restored to the original level. This restoration was often slower but was rarely faster. It seems, therefore, as though about 10 c.cm. of cerebro-spinal fluid were formed every hour, under conditions of repose. This method is indirect, but it probably gives a better index of the true state of affairs than the rate at which dye-stuffs are eliminated from the subarachnoid space, which has suggested a considerably more rapid formation and absorption of fluid.

The author's wide experience and sound judgment are shown in the sections of the book that deal with the localisation of lesions of the nervous system by injections of air, lipiodol, and coloured solutions. Two procedures which he specially recommends are little used in this country; the injection of 5 c.cm. of air by the lumbar route to determine spinal block, and the intraventricular injection of phenol-sulphone-phthalein in hydrocephalus and subsequent colorimetric examination of the urine, either with or without an examination of the cisternal fluid, to determine the degree of obstruction. For the localisation of spinal tumours he prefers heavy lipiodol by the lumbar route to either the cisternal injection of heavy or the lumbar injection of light lipiodol. Encephalography is not recommended but ventriculography, if not more than 20 c.cm. of air are injected slowly, he considers a safe and useful procedure. Comparatively little space is devoted either to the examination of the cerebro-spinal fluid or to the changes in the fluid in disease, but in these sections, as elsewhere in the book, what is said is well said and worth saying.

If more space were devoted to these subjects and the arrangement of subject matter were rather more formal this would be by far the best text-book we possess on the cerebro-spinal fluid. As it is it contains so much valuable information at so low a price that it should be assured of a wide circulation.

CLINICAL METHODS.

A Guide to the Practical Study of Medicine. Ninth edition. By ROBERT HUTCHISON, M.D., F.R.C.P., Physician to the London Hospital; and DONALD HUNTER, M.D., F.R.C.P., Assistant Physician to the Hospital. London: Cassell and Co., Ltd. 1929. Pp. 684. 12*s.* 6*d.*

WITH the passing of Dr. Rainy the assistantship of Dr. Donald Hunter has been incorporated in the present edition of this well-known book. It is difficult to imagine how much the medical student owes to this work, for its use has been universal; and it is equally difficult to imagine the clinical clerk passing through the wards without at some time or another being seen carrying this compact little volume. This new edition possesses the same clear exposition and the same wealth of detail as its predecessors. Additions have been made, especially in the chapters dealing with the nervous system and pathological fluids, and in the section upon bacteriological investigations.

Although much of the older material has been replaced, we feel that still more can be erased.

A book that has functioned so well and for so long must deserve credit from reviewers. A few omissions may, however, be noted. An indication of the value of the radiographic examination of the lungs as an aid to diagnosis might have been included, especially since the X ray appearances of the heart have already found a place. Twelve pages of the chapter on the central nervous system are still devoted to the electrical stimulation of muscles and nerves, but no space is given to the important changes that occur in the cerebro-spinal fluid in spinal block. When dealing with the stomach and its position in the abdomen the authors say that "recourse is frequently had to inflation of the stomach with gas" in order to outline the borders correctly. This gives a wrong impression; it must be rare nowadays for such a method of ascertaining the size of the stomach to be used. Many of the diagrams are rather old fashioned; Fig. 87, representing actinomycosis in sputum, is not worthy of the book and would be better omitted.

These are but details; this work stands to-day, as for years past, a sure guide to the student in the complexities of clinical medicine, both before and after qualification.

MEDICAL GUIDES.

Interns Handbook: A Guide to Rational Drug Therapy, Clinical Procedures, and Diets. By Members of the Faculty of the College of Medicine, Syracuse University, under the direction of M. S. DOOLEY, A.B., M.D. London: J. B. Lippincott Company. 1929. Pp. 254. 12*s.* 6*d.*

THIS symposium is drawn up for the newly qualified hospital resident by the members of the Faculty of the College of Medicine of the Syracuse University to help him when he gropes "for that exact combination of the familiar facts of anatomy, physiology, chemistry, bacteriology, pathology, pharmacology, and exact clinical procedures needed in the emergency." The authors take a justifiable pride in having furnished precise details of treatment which the student has only learnt in general principle, but as resident has to apply promptly and with decision. The book is designed for a special period of the medical man's life, though, of course, its value for other circumstances is almost as great. The information given falls under two headings—that of drugs (including treatment of poisoning) and that of clinical procedures. Under the latter are sections on clinical laboratory work, serums, diets, and on each of the different specialties which have place in a general hospital. Written chiefly for an American hospital, this book contains the information which any freshly qualified practitioner needs to carry him through his new work.

Medical Guide for India and Index of Treatment. Third edition. By Lieut.-Colonel E. J. O'MEARA, F.R.C.S. Eng., I.M.S. (Ret.), late Civil Surgeon and Principal of the Medical School, Agra. London and India: Butterworth and Co., Ltd. 1929. Pp. 1138. 25*s.*

THE condition of the recently qualified student of medicine in regard to medical practice in England, and his feeling of ignorance of the practical points which count, must be lived again when the English doctor is met by the problems of Indian practice. Lieut.-Colonel O'Meara's book, which is now in its tenth year and has reached its third edition, is one which introduces the medical man to the intricacies of practice in India. It is a synopsis of medicine in all its aspects, but throughout with a special application. This bias is especially marked in the sections on preventive medicine and sanitation, on medico-legal work and lunacy, on hospitals and nursing homes, foods, and dietetics. These are the branches of medicine in which practice differs most in different parts of the world. As an instance of the thoroughness of the work, we note that in the section on rabies it is not only stated where treatment is available, but also what travelling facilities are granted for patients to reach the treatment centres. This book lightens the burden of all Indian practitioners, but most of all of the newcomers to that country.

TRAITEMENT DES AFFECTIONS NEURO-CUTANÉES.

By E. JUSTER, Assistant, St. Louis Hospital. Paris: Masson et Cie. Pp. 126. Fr.14.

THE growing recognition of the sympathetic and endocrine connexions and interactions of the cutaneous tissues certainly justifies an attempt to consider certain dermatoses from a new point of view, and has, doubtless, inspired the author of this short treatise. It must, however, be constantly borne in mind that the facts at our disposal are few, and that until the physiologists are in a stronger position to teach the functions of the sympathetic and endocrine systems, and their biological connexions, we must not allow assumption to carry us too far in the channels of ætiology and therapeutic endeavour. We may perhaps admit the claims of alopecia areata, vitiligo, and Raynaud's syndrome to be attributed to endocrine dysfunction, and we may perhaps suspect that lichen simplex chronicus, lichen planus, and sclerodermia will ultimately join this group, but we have no evidence that would entitle us to include—as is here done—such conditions as premature baldness, hypertrichosis, pemphigus, kraurosis vulvæ, and the Fox-Fordyce disease. Most English authorities would not agree with the views put forward on the ætiological importance of congenital syphilis. It is very rare to discover a positive Wassermann reaction in a case of Raynaud's syndrome, for instance, and yet the French favour a luetic factor in its production. The issue is evaded by emphasising the frequent absence of a positive reaction in cases of tabes and allied conditions, and asserting that "the custom of demanding a positive W.R. is the cause of many diagnostic errors." The argument can, of course, be used by both schools, but it is going too far to suggest that "the discovery of serological tests may be regarded as a catastrophe for many, and that the attitude of physicians who refuse to make use of them is readily comprehended." Considering that this book is designed for the use of practitioners and lays no claim to be a scientific treatise, such views seem to lack the merit of caution and might have been differently expressed. On the whole, however, the production is well worthy of perusal by all who are interested in the progress of dermatology, and whose knowledge is sufficient to prevent a too ready acceptance of hypothesis in the guise of fact.

TUBERKULOSE PROBLEMER.

By R. KJER-PETERSEN, M.D. Copenhagen: V. Thaning and Appel's Forlag. 1929. Pp. 125. Kr.3.50.

THE author of this book, who is in charge of the Tuberculosis Station in Copenhagen, is a refreshingly bellicose crusader who employs his knowledge of recent tuberculosis work in Germany and England to bring home to his compatriots the errors of their ways. With the reputation for having the lowest tuberculosis mortality in Europe, Denmark has come to be regarded as a "show child," as a stick wherewith to beat more backward countries. But even a "show child" sometimes wanders from the paths of rectitude. The object on which the author breaks his first lance is the statistical service, which has supplied the, in his opinion, misleading calculation that the average duration of the life of a consumptive, dating from his first symptom, is between seven and eight years. The author's own calculations, which deal only with sputum-positive cases, shows that 76 per cent. of such patients die within two years of the appearance of the first symptom. He compares the inclusion of all tuberculous patients in one class, without reference to the presence or absence of tubercle bacilli in the sputum, with the inclusion of all cases of albuminuria, orthostatic and the like, under the term nephritis. A whole chapter is devoted to sanocrysin. This drug, according to Dr. Kjer-Petersen, has not only been useless in some cases and harmful in others; it has also distracted attention in Denmark from the remarkable advances in tuberculosis made in Germany in the last few years. The author describes the campaign in favour of sanocrysin rather derisively as "smart business." The chapter on artificial pneumothorax deals largely with recent German work on this subject, and with the claim made in this country in favour of submitting some 50 per cent. of all cases of pulmonary tuberculosis to this treatment. As for village settlements in general, and Papworth in particular, the author's opinion thereon is best indicated by his choice of the three most important milestones in the history of the treatment of tuberculosis—Brehmer, Forlanini, and Varrier-Jones. It is probable that never before have the problems of tuberculosis—prevention, pathology, treatment, and social action—been thrown into the melting-pot as they have at the present time, and the author has done good service in stirring this pot and ladling out samples of its contents to his colleagues. One of the chief lessons of his book is that the most rapid and effective way to solve the many problems of tuberculosis is to follow closely what the other man is doing, even though he be a foreigner.

DIABETES.

The Diabetic Life: Its Control by Diet and Insulin. Fifth edition. By R. D. LAWRENCE, M.D., M.R.C.P.Lond., Chemical Pathologist and Lecturer in Chemical Pathology, King's College Hospital. London: J. and A. Churchill. 1930. Pp. 204. 8s. 6*d.*

A Handbook on Diabetes Mellitus and Its Modern Treatment. By J. P. BOSE, M.B., F.C.S. Lond. Calcutta: Thacker, Spink and Co. Pp. 192. 8s. 4*d.*

The Diabetic A.B.C.: A Practical Book for Patients and Nurses. By R. D. LAWRENCE. London: H. K. Lewis and Co., Ltd. 1929. Pp. 55. 3s. 6*d.*

Diabetics: A Manual for Patients Suffering from Diabetes Mellitus. By JOHN KNOWLES, M.R.C.S. Eng., L.R.C.P. Lond., D.P.H. Manch. London: Faber and Faber, Ltd., The Scientific Press. 1929. Pp. 87. 3s. 6*d.*

Practical Handbook for Diabetic Patients. By ABRAHAM RUDY, M.D. Boston: M. Barrows and Co. 1929. Pp. 180. $2.00.

A Book for Us Diabetics and Our Doctors. By DON H. DUFFIE, M.D. Published by Author, S. Lancaster, Mass., U.S.A. 1929. Pp. 120. $1.50.

FIVE editions of Dr. Lawrence's excellent manual, "The Diabetic Life," have been published in six years. The chief changes made in the present edition are in matters of detail, which are, however, of very great importance to the patient. Drs. McCance and Lawrence have now completed an analysis of the different foodstuffs which contain carbohydrate. They have shown that the amount of carbohydrate which can be utilised by patients is, in many vegetables and fruits, much less than was supposed. Thus a patient who ate 8 oz. of cabbage under the impression that he was eating 5 g. of carbohydrate was actually eating only about 2·5 g. It is more than probable that the old carbohydrate values have been responsible for attacks of hypoglycæmia, owing to the exchange of vegetables which were erroneously supposed to have the same carbohydrate value. The revised figures should be distributed to patients as soon as possible. Many new recipes are included, and will add considerably to the choice of puddings and savouries which can be made. As the equivalent amounts of carbohydrate, protein, and fat are always given, these delicacies can be varied without causing any change in the total value of the diet. The general advice to the patient is very good. In this edition the question of marriage is discussed. It is stated that it is not dangerous for men, but that the woman does run certain risks. There is also the added consideration that the child may develop diabetes. Dr. Lawrence makes the point that for the woman able to carry through a pregnancy satisfactorily great self-control and determination are required, and that she is at least as likely to transmit these valuable qualities as a taint of hereditary disease. The balance of opinion is that while marriage cannot justly be forbidden, pregnancy is inadvisable in all but the exceptional case.

Dr. J. P. Bose gives the results of his work as a research worker at the Calcutta School of Tropical Medicine and Hygiene. The chapters on the physiology of sugar regulation in the body are full, and contain some original work by Dr. Bose and Colonel Acton. They have provided the explanation of the puzzling report which reached us some years ago that insulin was destroyed in the hot climate of India. The error arose because the insulin was tested out on the native or Himalayan rabbit, which is now found to be very insensitive to insulin. A dose which will cause severe hypoglycæmia in the Belgian hare, which is commonly used in England for assaying the strength of insulin, has no effect on the Himalayan rabbit. The latter also differs in being much more sensitive to adrenalin than is the Belgian hare. The dietetic scheme has been drawn up for the three types of patient seen in India: (1) the European or Anglo-Indian; (2) the Indian who eats a mixed diet; and (3) the Indian who eats a purely vegetarian diet. The instructions for arranging the diet are quite clear. The diet tables which are essential for giving variety to the patient are unfortunately drawn up on the old system of so many grammes of carbohydrate per 100 grammes, and are therefore nothing like so easy for the patient to follow as the English 5 g. system. The indications for the use of insulin are good, and the instructions for its administration and for the gauging of the correct dose should be easily understood. The book will be of especial value to all workers who have to treat patients in India.

Dr. Lawrence has done a good service to patients with diabetes mellitus in writing a simple book, designed expressly for them and their nurses. His more technical book reviewed above, while it provides excellent matter for doctor and keen educated patients, has frightened many who desire only to understand the simple rules of diet and not to think too much about their disease. The statements about diabetes and the principles of its treatment are put in very simple form, and the rules given for the administration of insulin are good. It would be an advantage if the method of filling the syringe were described with diagrams, since many nurses do not know how to do this properly. The line ration is fully described, and the food tables on which this method is based are very valuable. The tables are drawn up on the basis that the weights of the different articles all contain 5 g. This method, which was first introduced by Dr. O. Leyton, and then greatly extended by Dr. G. A. Harrison, makes it very easy for the patient to vary his diet. In another edition Dr. Lawrence might consider giving the figures for the proteins in 7·5 gr. portions instead of 5 gr. portions, so as to correspond with the line ration scale. The recipes will be of the utmost value to patients who crave for more variety in their diet.

In a small manual Dr. Knowles has set out the elements of what a diabetic patient should know. Thirty-three pages are given up to food tables; here, as in Dr. Bose's book, the substitution of the 5 gramme method of calculating would be appreciated by patients. The instructions for insulin administration are clear. It is surprising that a syringe is recommended which is marked in minims or c.cm. instead of in units of insulin, as is now usual.

Dr. Frederick M. Allen states in the introduction to Dr. Abraham Rudy's book that "diabetes presents peculiar problems to certain elements of our population." Dr. Rudy has written this handbook in order to make the path easy for some of the immigrant races of America and for strict Jews who keep to the kosher regulations. The introductory remarks about the nature of carbohydrates, proteins, &c., are simple but adequate. The rules for insulin and the general management of its administration are good. The chief value of the book, however, lies in the diet tables and recipes. The latter number 180 in all, and are suitable for American, Jewish, French, German, Italian, and Armenian tastes than for British ones. The tables are given in two forms—so many grammes of carbohydrate in 100 grammes of foodstuff, and also as either 3 or 5 or 10 g. of carbohydrate in so many cups of foodstuff. Once the measure of a cupful is realised, this method should make it easy for any patient to follow the instructions given. The book lacks a general index, but has a complete index of recipes.

Dr. Duffie's book is written in a very breezy style, and is full of quaint expressions. More than half of it is intended for patients, and the clear directions are illustrated by numerous photographs; those of the method of preparing the syringe and giving the injection are very valuable. The recipes are good, but the diet tables here also are expressed in terms of grammes of carbohydrate, protein, and fat for 100 grammes, instead of on the 5 gramme principle now widely accepted in Great Britain.

AIDS TO ORTHOPÆDIC SURGERY.

By ERIC A. CROOK, M.Ch. Oxon., F.R.C.S. Eng., Assistant Surgeon, Charing Cross Hospital; Surgeon, Queen's Hospital for Children. London: Baillière, Tindall and Cox. Students' Aids Series. 1929. Pp. 232. 3*s*. 6*d*.

THE author of this little duodecimo disclaims any pretention to encroach on the province of the orthopædic specialist, and only aims, as he says in his preface, to meet the needs of the student of general surgery. As far as it is possible to achieve this end in the space allotted Mr. Crook has succeeded in doing so. The book will serve to whet the appetite of the reader, and lead him to consult the larger monographs on the subject. Still better, he may be stimulated to take an interest in one or more of the orthopædic clinics which are now scattered about the country, and to learn there something of the practice of the specialty. The technique of orthopædics, more perhaps than any branch of surgery, needs personal experience and practice.

A NEW TREATMENT OF TUBERCULOSIS.

By PIERRE HULLIGER, M.D. London: H. K. Lewis and Co., Ltd. 1930. Pp. 146. 8*s*. 6*d*.

IN this book the author claims to have found a specific for tuberculosis. The treatment consists of hypodermic injections of a substance containing salts of copper, silver, tin, and manganese, but since we are not told the exact formula we have only the assurance that the treatment is new. At the beginning of the book the author discusses various other methods of treatment, altitude, fresh air, sunlight, pneumothorax, and tuberculin, and he points out that none of these methods can be called a cure; with this part of the book we rejoice to find ourselves in agreement.

The arguments used in favour of Dr. Hulliger's treatment are most unconvincing. Several plates are produced showing patients before and after treatment. In one case the cure was said to be obtained in 13 days, but we are not informed whether the patient remained cured. Although we have yet no cure for tuberculosis, many of the methods of treatment adopted undoubtedly help to arrest the disease. We can find no evidence in this book that the treatment advocated therein is effective even in this respect.

FULL DENTURE PROCEDURE.

By VICTOR H. SEARS, D.D.S., Professor of Prosthetic Dentistry, New York University College of Dentistry. London: Macmillan and Co., Ltd. 1929. Pp. 135. 8*s*. 6*d*.

DENTURE prosthesis has undergone many changes during the last 20 years, usually in the direction of greater complication of procedure. There are at the present time several methods of denture construction to which the names of different dentists are attached, all involving a complicated series of stages. Each advocate of a particular method claims that his technique produces dentures which are natural, efficient, and stable. The fundamental principles of denture construction have, however, changed little in essentials during the last 40 years or more. It is doubtful whether the complex elaborations which have become increasingly popular have really added much to our ability to construct useful dentures, especially since they are mostly based on conceptions of jaw movements which are still hypothetical. There are certain cases, however, in which a special technique will prove useful and may enable the dentist to succeed where ordinary methods fail. This book is a practical manual in which the different stages of full denture prosthesis are clearly described in detail. We have no doubt that if the author's directions are carefully followed the results will be good. At first sight it may seem that the technique described is laborious and tedious. In practice, however, the various stages should not tax unduly the patience either of dentist or patient.

This book should prove a useful addition to the library of the up-to-date prosthetist.

DENTAL HISTOLOGY AND EMBRYOLOGY.

Second edition. By B. ORBAN, M.D., Professor of Dental Histology and Pathology, Chicago College of Dental Surgery, Loyola University. Philadelphia: P. Blakiston's Son and Co. Inc. 1929. Pp. 218. 16*s*. 6*d*.

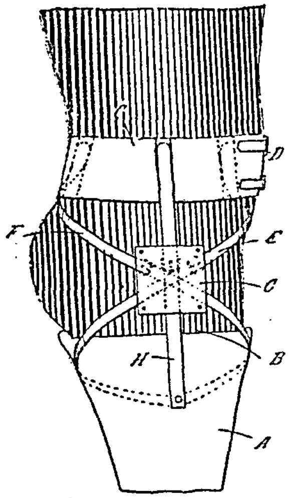
HITHERTO there has been no complete presentation in English of the work of the Vienna school of dental anatomy and pathology which has gained renown from the original work of Prof. B. Gottlieb in this field. Prof. Orban was a pupil of Gottlieb and is thus in a position to supply an authoritative account of his work on the development of the enamel cuticle and its relation to the eruption of the teeth and of the theory of the pathology of pyorrhœa which is based on this work. Many of the views held by Gottlieb and Orban are in conflict with those generally accepted, but the evidence here adduced is weighty and not lightly to be disregarded. The special value of the book is the large number of illustrations, chiefly photomicrographs, which are of unusual beauty. The text has been reduced to the minimum and is in the nature of a running comment on the illustrations rather than an illustrated treatise. Those familiar with the work of such microscopists as J. H. Mummery or Leon Williams know how clearly, in the hands of an expert, microphotographs can demonstrate the histology of the teeth. Prof. Orban's illustrations come up to the high standard set by these masters of the technique. No serious student of dental anatomy should ignore this book.

THE QUEEN'S HOSPITAL, SIDCUP.—The London County Council has decided to purchase this hospital for £20,000. The institution, which stands in 93 acres, is to be used as a convalescent home for patients from the hospitals that will be transferred to the Council on April 1st. A further expenditure of £7000 will be necessary to put the buildings in order, and the annual cost of maintenance, with 400 to 500 beds in average use, is estimated at £75,000.

New Inventions.

A BELT FOR THE ATTACHMENT OF ARTIFICIAL LIMBS.

In The Lancet of Nov. 10th, 1928 (p. 1008), there appeared under the title of An Improved Attachment for Artificial Limbs a short account of a body belt for this purpose, patented and introduced by Messrs. W. R. Grossmith. One of the difficulties which artificial limb makers have always had to contend with in cases of amputations of the thigh has been that of the method of attachment of the prosthesis to the patient's stump. This difficulty increases with the decrease of the length of the stump in more than an inverse ratio. It has been for years customary to attach the artificial limb to the body by means of suspenders passing over the shoulders. These might act satisfactorily in the erect position with the hip-joint extended, if carefully adjusted, but flexion of that joint and of the spine as in the sitting position threw the relationship between the parts and fittings concerned out of harmony, so that the socket of the artificial limb generally slipped forwards, or even—in the case of a very short stump—might slip off altogether. Moreover, the connexion between stump and socket was not a close enough one, and consequently allowed a good deal of play, or what mechanicians call "lost motion," with insecurity and inefficiency as a result. Various belts have been devised to meet this defect, and have been more or less successful, including, of course, the steel pelvic band and hip-joint, but the device referred to above seemed to me to be an improvement of promise and worthy of trial, and accordingly "security" belts were ordered for a number of cases by the Royal Surgical Aid Society. Enough time has now elapsed to enable some opinion to be formed as to the practical value of the belt, of which a diagram is reproduced herewith.



A. Thigh socket (or bucket) of artificial leg. *B*. Upper part of patient's stump. *C*. Waist-belt. *D*. Buckles of waist-belt. *E* and *F*. Leather straps. *G*. Guide over hip-joint. *H*. Additional strap, if required.

These patients have reported favourably, and those whom I have examined have a greater control of the prosthesis than they had formerly when wearing suspenders, and are less liable to falls. One patient whom I examined after some months' use of the belt said that she found herself able to check a stumble and recover herself in circumstances which with the old suspenders must have led to a nasty fall. Another case was one of an amputation leaving only 7 inches of stump, amputated 28 years ago, hitherto unable to walk without a noticeable outward swing. The wearer describes the benefits which she obtained from this attachment as: 1. In sitting in any public conveyance the leg does not slip at all, and keeps in a perfectly natural position without discomfort, either with both thighs parallel or with the two knees well apart. 2. In walking, the wearer is able to keep the leg as close as necessary to the sound limb and preserve a correct gait with an improvement in the contour of the hips. 3. She stated that a friend, seeing her for the first time since wearing the "security" belt, said, "It looks like you but it cannot be, as you are walking erect."

This attachment consists of a waist-belt furnished with a pair of straps, one of which is secured to the belt in front and the other to the rear of the belt, thence passing diagonally and crossing each other over the hip-joint, and finally passing around the thigh socket, and being there effectually secured to the inner side of the socket. These straps are adjustable for length, and, at the point of intersection at the hip, are arranged to pass freely through a guide. Further, where necessary, an additional strap is attached to the waist-belt at the outer side and carried straight down through the guide to the top of the socket of the artificial limb. It will be manifest that this arrangement of belt entirely obviates the necessity for any strap to pass directly downwards at the back of the wearer, securing much greater comfort in sitting. In addition to these advantages secured by this attachment, which can be fitted to practically every make of limb for thigh amputations, its very low cost is an important feature.

I may add that such a belt is peculiarly acceptable to female patients who find the use of suspenders very awkward, especially if they are inclined to embonpoint or have well-developed breasts.

E. Muirhead Little, F.R.C.S.Eng.,
Senior Surgeon to the Royal Surgical Aid Society, London, E.C.

Reports and Analytical Records.

ENERGEN BISMEAL NUTRIENT BREAKFAST FOOD.

(Energen Foods Co., Ltd., Energen Works, Willesden, London, N.W.10.)

It is claimed that 50 per cent. of this breakfast food consists of crushed whole wheat, from which nothing has been removed, the balance being made up of wheat gluten and milk proteins, the result being a "starch reduced" product suitable for a diabetic diet. On analysis the following results were obtained:—

	Per cent.		Per cent.
Moisture	10·0	Protein	35·0
Ash	1·2	Crude fibre ::	1·34
Fat	3·7	Carbohydrates ..	48·76

No trace of deleterious substances or preservatives was found. The calorie value of the food is 1714 per lb., and the composition of the food claimed by the makers is substantiated.

DEXTROSE ("CERELOSE").

(Corn Products Refining Co., New York, U.S.A., 17, Battery-place. London: Bush House, Aldwych, W.C.2.)

This sugar is a refined preparation of dextrose (glucose) made from corn (maize) starch. Chemical analysis shows it to be the pure hexose $C_6H_{12}O_6$ containing 7·6 per cent. of moisture, and having an optical rotation (calculated on the dry substance) of $[\alpha]_D + 53{\cdot}1$ at 68° F. Owing to its high degree of purity it is well suited for nutritional and other medical purposes.

North Middlesex Hospital.—This institution (950 beds) of the Edmonton Board of Guardians during the year ended on March 31st last admitted over 1000 patients more than in the previous year, the total, including births, being 9797; out-patients increased by more than 6000. Lieut.-Colonel Spencer Mort, the medical superintendent and director, reports that the accommodation is insufficient for ordinary requirements; in winter the pressure is severe. Increase of staff and further accommodation have, he says, become an urgent necessity. He adds that a special children's hospital for Middlesex is badly needed. At present children often occupy adult beds.

THE LANCET.

LONDON: SATURDAY, JANUARY 11, 1930.

LUNACY CERTIFICATION—FIRST AID FOR DOCTORS.

FURTHER and more leisurely study confirms previous estimates of the importance of the decision of the Court of Appeal in the case of Easton *v.* Johnson and Potts, discussed in THE LANCET of Dec. 28th, 1929, at p. 1371. By intervening at the outset to stay Mrs. EASTON's action against the two doctors who had certified her under the Lunacy Act, the Court relieved them of great anxiety and expense. Assailed by a claim for damages for negligent certification, a medical practitioner must fight to the end. It will make all the difference to him if the recent decision means that his preliminary right to ask the Court to stop the proceedings (under Section 330 (2) of the Lunacy Act) is really to furnish in future a substantial first line of defence. Has the law taken at last a turn more favourable to the medical profession? Will the House of Lords uphold the Court of Appeal?

An apparent change in the legal view deserves close attention. Under Section 330 (2), the Court is authorised to stay the plaintiff's proceedings against the certifying doctor if "satisfied that there is no reasonable ground for alleging want of good faith or reasonable care." In the Hume Spry case, Lord Justice BANKES seemed to hold that, in exercising this preliminary jurisdiction, the Court must not test the quality of the evidence; if there were any fragment of evidence in favour of the plaintiff, then—he seemed to infer—the Court must not at this stage weigh it against the possibly greater volume of evidence adduced by the defendant, but must simply decline to stop the case; if there were any scintilla of evidence to go before a jury in support of the claim, then the claim could not be withheld from the jury. Such a ruling, as Lord Justice GREER pointed out the other day, entirely nullifies the relief which Section 330 (2) was intended to give. There will always be some allegation on behalf of the plaintiff. "It is obvious," said Lord Justice GREER, "that any person bringing an action alleging that he has been improperly certified by the doctors, whether it be a man or a woman, will be able to put before the Court on affidavit some facts which, if proved, would support the action which has been commenced." It is highly probable, as the Lord Justice observed to Mrs. EASTON's counsel, that any plaintiff in this kind of action will say "I did not do any of the things they say I did; I did not have the delusions they say I had; I did not say to the doctors what they say I said; I am a perfectly sound man and I speak as such." That, said Lord Justice GREER, would be evidence of course that the certificate was given unreasonably; but if the existence of such evidence were to be allowed to bar the jurisdiction of the Court to make an order under Section 330 (2), it would be tantamount to repealing that enactment. "In my judgment the Court has to look at the whole of the evidence which has been put before it, and has, so far as it is possible, to weigh the evidence which has been given on affidavit, to come to a conclusion one way or the other as to whether there is reasonable ground for alleging want of good faith or want of reasonable care." Naturally the judges, especially those trained in the common law, dislike having to accept evidence in the form of affidavits; they would vastly prefer evidence which could be tested by cross-examination. But what else can they do? Parliament, as Lord Justice SCRUTTON observed, can hardly have intended that the Court, when exercising this jurisdiction under Section 330 (2), should hear all the witnesses examined and cross-examined; this would lead to almost as great expense as the full trial of the action. Parliament clearly contemplated that the Court, dealing with applications under Section 330 (2) to stay the plaintiff's proceedings, must work by means of something less than the full examination and cross-examination of witnesses; and so, though the Lord Justice added that he himself had very little faith in affidavits as a means of eliciting the truth, the Court must expect to have to weigh affidavits from the one side against affidavits from the other. Mere contradictory affidavits, said Lord Justice SCRUTTON, are of very little use to the judge in deciding whether he can stay the action. "If A, B, C, D, and E say one thing, and F, G, H, I, J, and K contradict them, that is not a case in which the Court can act, unless, indeed, A, B, C, D, and E have made such obviously ridiculous statements that it was clear that nobody would pay any attention to what they said; you must have such a state of things, in my view, that the Court is satisfied that no reasonable jury could on that evidence find that there was want of good faith or of reasonable care."

In Mrs. EASTON's case there was ample evidence from independent witnesses both to prove her delusions and to establish the fact that the certifying doctors had made a prolonged, and not a cursory, examination of her. The affidavits by medical witnesses in support of the two defendant doctors were authoritative and valuable. On the other hand, there were affidavits by two personal friends of the plaintiff, adduced on her behalf. These carried the less weight in that one of the friends had not seen her between May, 1926, and April, 1928, and the other had not seen her between 1918 and 1928. The latter in her affidavit suggested that it would have been sufficient to have placed Mrs. EASTON in a nursing home, but, as Lord Justice GREER said, "You cannot get certificates from doctors to make people go into a nursing home; if people do not want to go, they do not go." Possibly it was the plaintiff's own affidavit which was most damaging to her case, because the Lords Justices were able to find admissions in it which reconciled them to the absence of cross-examination. Mrs. EASTON's affidavit purported to be a reply to the affidavits filed by the medical and other witnesses recounting her delusions. Her affidavit gave so qualified a denial to some of the statements attributed to her that it went some way to confirm the truth of the affidavits on the other side. Moreover, her affidavit did not deal at all with some of the acts and speeches which had been cited as evidence of her insanity; her counsel seems to have conceded that by this omission she must be taken to have admitted the truth of them. Master JELF and Mr. Justice FINLAY (whose decision not to stop the case the Court of Appeal over-ruled) were mainly concerned, we know, with an affidavit by Dr. RISIEN RUSSELL. Mr. Justice FINLAY hinted that he thought Mrs. EASTON's action had no prospect of success, but he felt that Dr. RUSSELL's affidavit constituted some evidence which a jury might deem to be in her favour. The history of this affidavit seems to have been as follows. Counsel for the defendant doctors, when applying under Section 330 (2) to Master JELF, apparently quoted Dr. RUSSELL's affidavit in the

Hume Spry case to the effect *that it was not* essential to have a physical examination of the person to be certified. The Master then asked that Dr. Russell should make an affidavit as to the necessity of a physical examination in Mrs. Easton's case. Dr. Russell thus came to assert the series of physical examinations which he said should have been made. The pupil of the eye should have been examined—an ophthalmoscope employed to detect pressure on the brain—search made for tremor of the face, tongue, and hands—knee-jerks tested, and so on. What the Court of Appeal thought of these assertions we know. Lord Justice Greer said that, if it were literally true that there must be no certification without physical examination, then, even when an alleged lunatic came into a room with an open knife and attacked the two doctors and afterwards tried to kill himself, it would still be necessary, according to Dr. Russell, that they should test his physical jerks before certifying him. Lord Justice Scrutton, as reported in our columns a fortnight ago, said that a doctor who comes to examine an alleged lunatic is not employed by the patient and has no authority to apply all these tests to which the patient would probably object strenuously. He mentioned the case (which he had once tried at Exeter) of a lunatic who believed himself to be a member of the Royal Family, with special rights of punishing anybody with whom he disagreed. If the patient expressed such delusions, a careful doctor (provided that he were satisfied that the patient was not playing him a joke) would be entitled to deem him of unsound mind without further examination.

The upshot of the Court of Appeal's decision is to furnish valuable first aid towards the relief of a certifying doctor from legal liability. But everything will depend upon the evidence which the doctor will be able to produce on an application under Section 330 (2), when he asks the Court to stop the plaintiff's action. He should put himself in a position to prove, for example, so small a matter as the length of his examination; by noting down the time taken he may be able afterwards to refute the usual allegation by the patient that the examination was casual and perfunctory and that "he only looked at me for a couple of minutes." And the doctor should bear in mind the value of corroboration. All this precaution adds new worries to the never very welcome duty of certifying. But it may save trouble in the end with the law as it is.

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AN EAST AFRICAN MEDICAL RESEARCH FUND.

In the 200,000 square miles over which are scattered the native reserves of Kenya there live 2,500,000 Africans, poor, illiterate, destitute even of such household furniture as a bed, and usually without clothing. Not less than 1,000,000 of them are constantly suffering from malaria, and probably not more than a score are within reach of a medical man. Their malarial index is, in places, as high as 80 per cent., and certain of them pass from their reserves to work on farms, roads, railways, and in towns, where they generously spread their infection to European and Asiatic non-immune immigrants. These Africans formed the core of the problem which confronted Colonel S. P. James, the advisor on Tropical Diseases to the Ministry of Health, when he was deputed to tour East Africa and report on the malaria position there, and the measures which could be taken to mitigate it. First of all, as he points out in a report now published,[1] he had to determine where a beginning should be made. Was the economic state of these people to be bettered, so that their health should be improved, or was the attack to be begun in the other direction? He makes clear once again that there is no royal road to malaria control, but that the best means of effecting this must be discovered afresh for all localities, for they vary with different conditions of climate and population. In the great area under discussion the measures needful for a direct attack on the malaria parasites in man and anopheles would be difficult and expensive, and their application would be beyond all available resources. Merely to envisage the task of screening the rough shelters of these people, of inducing the general use of mosquito nets, mosquito boots and quinine, and of applying anti-larval measures generally, is to be convinced of its futility. Economic progress must be made, and the native must be educated to realise the advantages he can get from the applications of medicine and hygiene before any real beginning can be made in the effort to stamp out malaria from the native reserves, and thus to eliminate a reservoir from which malaria is being widely diffused through Kenya.[2] This will be a long process, and no dramatic results can be looked for to cheer those who spend their lives in propaganda which will take generations to soak in.

Fortunately an indirect attack—or, in other words, the application of well-tried measures directed to protect from malaria farms, railways, roads, and towns—is feasible and promising, but here again Colonel James insists that there is no short cut: even now much investigation in field and laboratory is needed before local antimalarial work can be used to the greatest advantage. The small technical staff required for this work, who might receive part of their training in India, includes a medical entomologist and an antimalarial engineer; this team should, it is advised, continue and extend the work initiated by Colonel James—work which implicated *Anopheles funestus* and *A. costalis* as two of the local carriers; and should keep in touch with the world's malaria literature and with the technical experts of all the Government's departments, whose activities may influence malarial incidence. Sound measures are advised to meet the special needs of certain sections of the community, but Colonel James refuses to minimise the considerable difficulties involved. For instance, Colonel James found that while in Uganda and parts of Rhodesia everyone who could afford it had a screened house, in Kenya hardly anyone seemed prepared to pay for this protection; and he cites a case where, in spite of nine attacks of blackwater fever between them, a farmer and his wife had been content to live for sixteen years in the same necessarily unscreened wattle and daub house. Not that screening can be firmly trusted; inside all the screened houses of Government officials with whom he stayed Colonel James caught mosquitoes, and it is specially significant that medical officers living in these same screened houses saw to it that they and their families wore mosquito boots after dark, and slept under curtains. Since then, whether from faulty workmanship or from the carelessness or laziness of servants, screened houses are not in practice mosquito-proof, it is only by incessant watchfulness that even Europeans can escape malaria until such time as steady, sanitary education of all races has done its slow work. Regarding towns, Colonel JAMES writes "no anti-malarial scheme, based on measures to reduce mosquitoes has ever been successful which did not include legislation to enforce the necessary measures." Research and education working hand in hand hold promise for the future, but discipline must also play a part.

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[1] Report on a visit to Kenya and Uganda to advise on antimalarial measures. By S. P. James, I.M.S. (retd.), Advisor on Tropical Diseases to the Ministry of Health. Published by the Crown Agents for the Colonies, 4, Millbank, London, S.W. 1s.

[2] A Government report on the public health of Kenya for 1928 has just been published, and is reviewed on p. 113 of this issue. It provides some pertinent intelligence as to the malarial position existing during the year.

For the furtherance of research the pattern advised is the Indian Research Fund Association, with its record of valuable work, its annual Government contribution of £33,000, and the aid given to it by donors from the general public, who thereby obtain the privilege of suggesting lines of investigation. The report advises the initiation of an "East African Medical Research Fund," with a yearly grant of £5000 from each of the Governments of Kenya, Uganda, and Tanganyika. The aggregate amount would suffice to maintain workers set apart for the sole study of malaria, and would thus provide for that intensive scientific campaign for which the PRINCE OF WALES asked so earnestly in a speech delivered in Nairobi on Armistice Day, 1928. This speech made a profound impression in East Africa, and was clearly responsible for initiating the investigation from which Colonel JAMES's admirable report has emerged. Some local disappointment may be caused that no more concrete suggestions could be made. The lay public wearies of exhortations to spend money on research, when it would welcome a demand for a greater sum for a well-defined, simple scheme of engineering. But Colonel JAMES has spoken bravely and honestly, and no one who knows anything of endemic diseases will disagree that while our tropical lands can exchange experiences with advantage, each one has to work out for itself, in its own place, its own malarial problem.

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DEPRESSION.

THE comparison between DARWIN and FREUD has recently been drawn afresh. In many respects the troubles of psychiatrists to-day do indeed resemble those of zoologists when DARWIN had convinced them that their systematic zoology must be reconciled with the process of evolution. Great geniuses like KRAEPELIN had studied the end-products and described outstanding groups of mental symptoms, cutting, so to speak, transverse sections of mental disorder. Then came FREUD, insisting, as Sir FARQUHAR BUZZARD pointed out in the Purvis Oration which we published last week, on a longitudinal section, wherein the evolution of these disorders could be traced from earliest childhood and before. This inevitably meant some confusion; apparently related species were found to have very different origins, while offspring of one kind of psychological trauma might diverge to produce very different-looking diseases. Systematic psychiatrists are still struggling with the reorganisation of their classification, and the general practitioner may well feel helpless and bewildered when he is called upon to deal, practically and promptly, with the end-products. Suitable treatment for one kind of mental disorder may be the worst thing in the world for another kind which closely resembles it, and two apparently similar cases call for widely differing prognoses.

Commonest of all symptomatic groups is that which may be vaguely called "depression." Hardly a day passes but the practitioner meets a patient who complains of lack of enthusiasm and vitality. The doctor has to decide, perhaps quite promptly, whether the case calls for a tonic, a digestive, a search for focal sepsis, a cheery reassurance, a pathological examination, a psychological analysis, a rest, or a certificate under the Lunacy Acts. He has also to struggle against the almost overwhelming temptation to make a meaningless diagnosis of "a bit liverish" or, as Sir FARQUHAR BUZZARD suggests, "neurasthenia"—a diagnosis which will very likely satisfy the patient but can never satisfy the professional conscience. He owes a real debt of gratitude to those leaders who, like Sir FARQUHAR, try to differentiate for him the different types of mental case in language free from technicalities. From the "dump" of neurasthenia Sir FARQUHAR draws out two distinct groups, the anxiety state and the manic-depressive state. Some of his readers may be troubled by a suspicion that the problem is not quite so simple as they are here led to believe, but most will be more than grateful for guidance in the distinction of types of depression which require fundamentally different treatment. An important fact not taught in the medical schools until quite recent times is that there are far more manic-depressives outside than inside mental hospitals. It may not be wise to admit to the patient that his depression, though it may have been precipitated by some external cause, is really only the reverse picture of his own buoyant self-confidence and that in time the cycle will be re-established. But it can do no harm to dissuade his friends from attempts to brace and activate a mind whose depression increases after effort and whose chief symptom may be an abnormal fatiguability. A practitioner who has grasped the distinction insisted on by Sir FARQUHAR has at least his mind open to the study of one of the commonest and most distressing maladies he will meet, and has put himself in a position to help both the patient and his friends.

Dr. R. D. GILLESPIE from his experience at the Cassel Hospital has also been trying to differentiate various types of depression,[1] and distinguishes three classes: the reactive, the autonomous, and the involutional. In the first group he puts those who are susceptible to environmental influences, both internal and external, and whose illness seems to have been precipitated by some obvious external cause, such as sickness, bereavement, or business difficulties. The autonomous group is a mixed one, including depressions which appear as part of the splitting-up of a personality (schizophrenic), those which are part of the direct development of a personality, and those which appear as a phase in a mood-cycle (manic-depressive). In this last group the condition varies little if at all in response to intercurrent stimuli, and a tendency to self-accusation is much more often found here than in the reactive group, whose victims generally blame their environment. Dr. GILLESPIE thinks that the presence or absence of reactivity is likely to be the most useful sign in indicating prognosis and treatment, although he admits that no one sign can ever be a touchstone. The prognosis is much better for the reactive than for the autonomous, and only the reactive are at all accessible to psychotherapy. Another effort in the same direction is that of Dr. MARJORIE FRANKLIN[2] who distinguishes psychoses, psychoneuroses, and character-formations. She approaches them from the evolutionary point of view and characterises the psychoses as those conditions in which the fixation is at a low—first and second oral or first anal—stage, the object relationship auto-erotic or narcissistic, destructive impulses strong and ego changes predominant. In other words, the psychotic ego is so changed that it will tolerate uncritically or fail to recognise as arising from itself the repressed impulses and phantasies. In the psychoneurotic states the fixation is on a higher level—second anal, phallic, or genital—the destructive impulses and narcissism less marked and the changes predominant—i.e., the repressed material returns in a distorted form which is acceptable to the ego. In character-formations the trouble is more diffuse, resembling a toxæmia rather than an abscess; the patient is in much closer contact with reality and tends to work off his conflicts by outward behaviour. Dr. **Franklin** refrains from emphasising diagnostic points, admitting that diagnosis must be based on a clinical sense and an observation of what is, rather than a tracing of how it arose.

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[1] Guy's Hospital Reports, 1929, lxxix., 306.
[2] Journal of Mental Science 1929, lxxv., 671.

The practitioner is not always able to learn much from these careful studies. Dr. **Franklin** speaks in a tongue so specialised, as is necessary, that few can profit from her guidance. Dr. **Gillespie's** differentiation of depressive states is not easily followed by those unfamiliar with the language of modern psychiatry. These two workers and many others are recording their experiences for the expert to interpret and criticise. Doubtless they hold that the time for simplification is not yet. It is true that a great deal more patient and laborious investigation is necessary before the practitioner can expect any handy diagnostic chart to help him in differentiating his depressed patients. Only those who have had long and intensive experience of mental disorders can make reliable diagnoses and indicate the best treatment, and even they are liable to a wide margin of error. Sir **Farquhar Buzzard** is not addressing experts. He speaks to those whose training in psychical disorders has been far outstripped by their training in physical ones. His teaching is the more valuable because it comes from one who is known to be a physician with a special bias towards organic neurology. If the practitioner will adopt as a preliminary working rule the simple distinction he draws, the unfortunates whose mental state is not amenable to brisk encouragement and arises from no preventable or curable lack of adjustment to environment will be saved from the whip that jocular friends can wield. The anxious, on the other hand, will not be left to brood in solitude but will be helped to believe in their own fitness to shoulder their burdens.

Fellowship of Medicine and Post-Graduate Medical Association.—An all-day special course in Diseases of Children will be held at the Queen's Hospital from Jan. 13th to 25th. This hospital specialises in teaching by demonstration rather than by lecture. From Jan. 27th to Feb. 8th an intensive course in medicine, surgery, and the specialties will be held at the North-East London Post-Graduate College (Prince of Wales's Hospital, Tottenham, N.) from 10.30 A.M. to 5.30 P.M. daily. Members of the Fellowship not taking the whole course are invited to the formal clinical lectures at 4.30 P.M. On Jan. 21st the Fellowship will start a new series of lectures at the Medical Society of London's lecture room. The lectures will be given at 4 P.M. on Tuesdays and are free to members of the medical profession. (It is to be noted that their day and hour has been altered.) Detailed syllabuses of these courses and lectures may be had on application, as also of the new series of clinical demonstrations in medicine and surgery, beginning on Jan. 23rd, at various London hospitals. Besides the special courses arranged for 1930 the Fellowship arranges a general course consisting of the clinical practice of its associated hospitals. Ticket-holders are provided with a programme which sets out the names of the clinics under subject headings, leaving them free to make out a time-table in accordance with their requirements. Tickets are issued for periods ranging from a week to a year. Arrangements can also be made for part-time work.

Annotations.

"Ne quid nimis."

NATIONAL HEALTH INSURANCE: TWO POINTS OF VIEW.

The French Academy of Medicine, at their séance on Dec. 3rd last, received two important communications on national health insurance which are of special interest at the present time in view of the recent legislation making health insurance compulsory throughout France. The first, that of M. Paul Strauss, "Les bienfaits des Assurances sociales pour la Santé publique," placed compulsory insurance in a very favourable light, while in the second, that of M. Weiss, Dean of the Strasburg Medical School, "Les dangers de l'Assurance contre la Maladie," a strongly opposed view was taken. The two communications and the discussion that followed make interesting reading for those who are concerned with health insurance in this country.

M. Strauss contended that during the many years that the system of compulsory health insurance had been working in Germany (and Alsace-Lorraine) the criticisms directed against it had dealt with details only, and that the beneficial effect of the system on the public health had never been questioned by any well-informed *hygiéniste*. The attack of Dr. Liek, whose book has recently been translated into French by M. Weiss under the title "Les méfaits des Assurances Sociales et les moyens d'y remédier," and that of Prof. Eppinger, which was communicated to the Academy on Oct. 22nd by MM. Merklen and Wolff, can be regarded as of individual character, representing nothing more than isolated opinions. Against them he placed the fact that 85 per cent. of the doctors in Germany were in the service of the insurance societies (*Krankenkassen*), and that the organised body of the German medical profession, at their congress at Essen in June, 1929, while contending that insurance administration should be amended—particularly by the general recognition of the principle of free choice of doctor and the removal of restrictions on entrance into insurance practice—had nevertheless recorded their view that the insurance system is indispensable to the German people. M. Strauss referred to the three monumental studies of national health insurance published in 1928 by the International Labour Office, and claimed that these documents showed that the German insurance societies had developed into potent agencies for the promotion of public health. At first chiefly concerned with administering cash benefits, they were now providing general practitioner, specialist and hospital treatment on an extensive scale, not only for the insured population but also for their dependents, and were to a rapidly increasing extent developing measures of prevention. He contended that the improvements in public health in Germany that had been secured during recent years were largely due to these organisations, and he gave statistics which he thought told strongly in favour of this view.

M. Strauss was followed by M. Weiss, who took up a contrary position. He also had recourse to statistics, and quoted figures which, he held, showed that in certain important matters—e.g., the prevention of infant mortality and of tuberculosis—Germany with her insurance system had lately fallen behind France and the United States, where (apart from Alsace-Lorraine) there was as yet no compulsory insurance actually in operation. He thought, however, that the value of a national insurance system could not be estimated by statistics, but only by a close study on the spot of the actual working of the system, and of its influence on the patients, the medical profession, and the public health. For years he had studied the system in Alsace, and he had been compelled by the facts to take the view that its influence on all three had been harmful. The vast sums expended by the insurance societies would, he said, have been far better employed in developing the services of public hygiene, in which lay the surest hope of health progress. The treatment given to insured patients was, he found, often open to criticism, partly owing to the interference of the insurance societies with the discretion of the doctors, of which he gave examples. What, however, gave him most concern was, as he considered it, the degrading effect of the insurance system on the morale and efficiency of the medical profession. It began among the students, who, knowing that insurance practice will be open to them after qualification, hasten to obtain their diplomas with the minimum of study instead of taking the fullest advantage of the facilities offered them to equip themselves with the skill and knowledge by which alone they can become worthy of their vocation. Entered upon insurance practice, the doctor was under great temptation to scamp his work, and in particular to yield to the importunities of patients to issue certificates of incapacity without sufficient justification. The medical profession was being divided into two classes—private practitioners and the doctors in the employ of the insurance societies, and its prestige had been seriously lowered in public estimation. He viewed the effect of the insurance system on the medical profession with grave concern.

It would seem that M. Strauss has painted too bright and M. Weiss too dark a picture. On the one hand, it can hardly be doubted that the past conflicts between the German *Krankenkassen* and the doctors have not enhanced the credit or the efficiency of the German insurance system, and there are those who hold that the activities of the *Krankenkassen* have encroached upon the field of the public health authorities, with consequent overlapping and waste of effort—shortly, that the work of the two sets of organisations stands much in need of coördination. On the other hand, it is difficult to accept the pessimistic view taken by M. Weiss. In every profession there are individuals who fail to reach a proper standard of professional conduct, and the instances given by M. Weiss seem to afford an insufficient basis for his general indictment of the insurance system. It is curious that on neither side was any reference made to the British system of national health insurance, in the administration of which, especially in the disciplinary procedure, the medical profession takes a prominent part. The amendments of insurance administration for which the German doctors have long been contending have for the most part been embodied in the British system since its inception, and M. Weiss and those of his colleagues who share his forebodings might with advantage devote some attention to the conditions under which insurance practitioners are working in this country.

THE DICK TEST IN MANCHURIA.

IN another column we publish an abridged account of recent observations on scarlet fever carried out at the Japanese Isolation Hospital, Dairen, by Dr. T. Toyoda and his colleagues. This work will not fail to attract interest in this country, since most of the difficulties which have been met with by British workers are recorded and discussed. For example, from general principles and from analogy with the Schick test it would be expected that all patients in the initial stages of scarlet fever should be Dick-positive. In the early history of the Dick test it was at one time thought that all patients in the later stages of convalescence should be Dick-negative, but in recent work this has not been observed in any large series of cases even where great care has been taken in adjusting the Dick dose. In a series of tests recorded by C. C. Okell and H. J. Parish,[1] 18 per cent. of late convalescents were Dick-positive and 65 per cent. of medical students with a convincing past history of scarlet fever were Dick-positive; though, if the incidence of relapses and second attacks is considered, it is almost certain that the majority of these Dick-positive persons were not susceptible to the disease. Toyoda and his colleagues found 15 per cent. of convalescent patients and 25·4 per cent. of persons with a past history of scarlet fever to be Dick-positive.

In order to explain these and other difficulties K. Ando,[2] also working in Dairen, has made a careful study of the constitution of Dick toxin. He believes that he can separate the toxin into a heat-labile and a heat-stable constituent. The former appears to have the properties of scarlet fever toxin proper, the latter to have certain allergic properties which are held to account for the majority of difficulties met with in interpretating the Dick test. What the relationship is of these two fractions to the nucleoprotein and the carbohydrate substance described by O. T. Avery and M. Heidelberger, H. Zinsser and his associates, and R. C. Lancefield in connexion with the cell constitution of bacteria, further investigations will no doubt show. Toyoda and his colleagues have found that individuals with a positive Dick test may have enough antitoxin in their serum to blanch a scarlet fever rash when used in the Schultz-Charlton test. They find that such individuals are sensitive to the heat-stable but not the heat-labile constituent. They comment on the known difficulties of obtaining complete neutralisation when mixtures of Dick toxin and antitoxin are injected into certain people. When the heat-labile constituent alone was used the number of Dick-positive patients in late convalescence was materially reduced. Pseudo-reactions are ascribed to the heat-stable constituent; they are, however, so rare with the toxin preparation used in this country that it is doubtful if the explanation of Ando and Toyoda can be held to account for the difficulties of interpretation which are met with by workers with the Dick test here and elsewhere.

The Japanese workers have brought forward a carefully documented report which confirms in general the experience of most modern workers on scarlet fever. They consider the hæmolytic streptococcus to be the sole ætiological agent in scarlet fever, that the Dick test is a valuable guide to susceptibility even in its present form, and that antitoxin is of great value in the treatment of the disease. By their analysis of the active constituents of Dick toxin they have opened up a field of inquiry which can hardly fail to arouse general interest and which may possibly lead to considerable practical improvements in the Dick test.

INTERNAL DERANGEMENTS OF THE KNEE-JOINT.

IN a report[3] presented to the annual congress of the Swiss Surgical Society Dr. Raoul Hoffmann, of Geneva, discusses the relation between injuries of the semilunar fibro-cartilages and arthritis deformans. His figures are drawn from the records of the Swiss assurance institutions, and the value of the provisional conclusions is much reduced because the patients were insured and were not in a hurry to get well, and because the operations were done by surgeons of very diverse technique. Moreover, he is unable to say from the available statistics what is the relative frequency of arthritis deformans in knees operated upon, as compared with those treated without operation. His personal experience suggests that other lesions associated with rupture of a meniscus play an important part in producing arthritis. The second and by far the greater part of his report, however, deals with the surgery of menisci in England. This, he says, is remarkable—for its quality doubtless, but still more for quantity—since individual operators have two or three thousand arthrotomies for meniscal lesions to their credit. The English technique is long-established, so that specialists have scarcely changed it during thirty years; yet statistical studies are scarce, possibly because the operation has become so firmly grounded as to need no more discussion. Dr. Hoffmann made a special visit to this "Holy Land of internal derangement of the knees" last spring when he spent a fortnight interviewing surgeons and studying their work in London and Newcastle-on-Tyne and, doubtless, Liverpool. His conclusions, which are obviously intended for Swiss and not for British readers, are sufficiently complimentary to our surgical self-respect, but it is unnecessary to follow him into details which will largely be familiar. His researches at home and abroad lead him to say that arthritis deformans cannot be always avoided after operation; that the more perfect the operation the less is the risk; that complications such as foreign bodies (implying previous inflammation) greatly worsen the prognosis; and that the patient's susceptibility is an important factor. He is disposed to lay stress on the views of Leriche, who holds that trauma unfavourably affects the sympathetic innervation of a joint and that through the action of this system arthritis may supervene even when an operation has been conducted with perfect technique and for an uncomplicated cartilage lesion. Finally, Dr. Hoffmann concludes that meniscotomy, notwithstanding its present imperfections, is justifiable and often necessary, for in the great majority of cases its benefits much outweigh its drawbacks. This is a conclusion which many surgeons in this country will consider almost pessimistic. In the absence of knowledge of the frequency of arthritis deformans in knees whose semilunar cartilages have not suffered known injury, and on which no operations have been performed, it seems impossible to decide in any given case whether arthritis when it supervenes on meniscotomy is or is not caused by the surgeon's intervention.

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[1] THE LANCET, 1925, i., 712.

[2] Jour. Immunol., 1929, xvii., 361.

[3] Schweiz. med. Woch., Dec. 7th, p. 1271.

EFFECT OF LIVER ON NERVOUS LESIONS OF PERNICIOUS ANÆMIA.

WHEN liver diet was introduced for pernicious anæmia it was hoped that the nervous manifestations of the disease would respond to the treatment. Exactly how far they do so is still doubtful, for the reports are somewhat contradictory. C. C. Ungley and M. M. Suzman[1] have investigated the histories of 61 patients showing nervous symptoms; 30 of them had received a diet containing large amounts of liver while the other 31 had not. In the first group 17 had improved and 5 had died, whilst in the second group none had improved and 28 had died. These writers think that the benefit was due rather to some specific effect of the liver than to mere improvement in the blood count and general condition; they suggest that pernicious anæmia is probably a deficiency disease in which constitution plays a large part.

But the good results they record are not consistent with the usual experience. Thus Hans Curschmann[2] goes so far as to say that he has not yet seen a single case of pernicious anæmia in which the spinal symptoms were definitely improved by liver. Many, indeed, had actually deteriorated under this treatment, and Curschmann lays stress on its ineffectiveness even in those cases in which the blood changes are but slight. It is clear, he says, that the nervous lesions may actually get worse after the blood picture has returned to normal and the condition has otherwise improved. In a review of the subject which was published not long ago in our own columns[3] Dr. Douglas McAlpine noted this same fact and pointed out that it is the spastic type of degeneration which most particularly progresses in spite of treatment. Of his 11 cases only four made slight improvement whilst four became definitely worse. He observed some benefit upon mild mental symptoms from the action of liver diet and some lessening of paræsthesias but found no appreciable change in the reflexes. He concluded that the effects of liver treatment upon the nervous symptoms are variable, and that it does not directly combat the neurotoxin which is at work. Curschmann also supports the original theory of Minnich that the myelitis and the anæmia are brought about by a common toxin which in one case affects especially the blood, in another the spinal cord, and in a third the two together. Thus the cord symptoms may be present even before any detectable evidence of anæmia is present—a fact which bears against the theory that the anæmia itself leads to a nutritional disorder of the spinal cord. Moreover, the severest forms of secondary anæmia are only very rarely associated with nervous complications, whereas they are a common accompaniment of pernicious anæmia. And the patients in whom mental changes were noted by McAlpine had none of them a red cell count below 3,500,000. Ungley and Suzman, however, consider that with improvement in the blood picture the cord changes may so regress as to show that they are not necessarily permanent.

There can be no doubt of the persistence of achylia gastrica under liver treatment, and it certainly seems as though liver therapy was largely symptomatic and not directed towards the actual cause in this disease. In THE LANCET of Jan. 4th (p. 22) Dr. A. C. Hampson reported a case which seems to be entirely refractory to liver treatment and some observers think that the number of more or less refractory cases is increasing. On the other hand, many patients have been able to omit the diet without any apparent relapses. Further research will probably prove that something more than a simple dietetic deficiency is at the root of the complex syndrome of glossitis-achylia-pernicious anæmia-degeneration of the spinal cord. Truly radical therapy is likely to take the form of eradication of some provocative toxin—perhaps from focal sepsis—rather than the removal for symptoms by the use of liver.

OBSTRUCTION OF THE CENTRAL ARTERY OF THE RETINA.

CASES of sudden blindness in one eye are far less common than the histories given by patients would lead one to suppose. One of the most frequent causes of such a symptom is the sudden stopping of the vascular supply of the retina. The ophthalmoscopic picture is characteristic when the patient is seen within the first few weeks after the onset of blindness. Besides the noticeable diminution of the size of the blood stream in the retinal arteries, and the almost complete cessation of the circulation (shown by the impossibility of producing pulsation by pressure), there is an unmistakeable cherry-red spot at the macula, due to œdema of the surrounding retina. Following von Graefe, who first made the diagnosis in 1859, the older text-books always speak of the condition as "embolism of the central artery of the retina." For many years it has been well recognised that not all these cases are due to embolism. Primary thrombosis has been suggested as the cause in cases where there were prodromal attacks of temporary obscuration of vision. For the last 30 years or so much stress has been laid on disease of the inner coat of the artery—"endarteritis obliterans"—as a possible cause of the obstruction, according to some authorities by far the most usual cause. The possibility that muscular spasm of the arterial wall occurs and lasts long enough to cause death of the ganglion cells supplied by the artery must also be considered. Many cases have been recorded in which actual contraction and subsequent relaxation of the retinal arteries have been observed with the aid of the ophthalmoscope, and it must be remembered that spasm, besides being a primary cause, might be secondary to an embolus or thrombus. In the November number of the *British Journal of Ophthalmology* H. V. Coverdale publishes a study of 11 cases of obstruction which came under his notice last year when he was house surgeon at Moorfields. Eight of these patients had valvular disease of the heart, a circumstance that points to embolism as the cause of their eye lesion. In one case there was definite proof of embolism, so far as ophthalmoscopic examination can prove anything, for an obstructive white mass seen at the bifurcation of the artery on the disc was definitely observed to move on into a peripheral artery as the result of vigorous massage and the administration of nitrite of amyl, given within three hours of the onset of blindness. Pathological proof of the occurrence of this phenomenon has been afforded in rare cases where the patient has died within a few days of the onset of blindness, and the eye was examined before secondary changes made impossible any distinction between embolism and thrombosis.[1] The proof that embolism is at any rate one cause of the condition may be considered complete. As much may be said for endarteritis, when the inner coat of the artery gradually becomes thickened till the blood stream becomes so tenuous that a slight diminution in the pressure from behind is sufficient to stop the stream altogether. In these cases and in those due to primary spasm prodromal attacks generally precede the onset of blindness.

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[1] Brain, September, 1929, p. 271; Newcastle Med. Jour., 1929, ix., 67.

[2] Med. Klin., Nov. 15th, 1929, p. 1767.

[3] THE LANCET, 1929, ii., 643.

A further matter discussed in Mr. Coverdale's paper is the reason why the stoppage of the circulation in these cases is seldom absolutely complete. In some cases the papillo-macular triangle is supplied either by an obvious cilio-retinal artery or by one arising from the central artery on the proximal side of the spot occupied by the plug. Apart from these cases there is evidence that a certain amount of capillary anastomosis occurs between the capillaries in the immediate neighbourhood of the disc and those derived from the choroidal circulation. It is possible that there may be a similar capillary anastomosis between the capillaries at the extreme periphery of the retina and those derived from the anterior ciliary vessels. Mr. Coverdale suggests that even without any capillary anastomosis there may be collateral vessels from the ciliary circulation in the neighbourhood of the disc, too minute to be detected with the ophthalmoscope. The nourishment derived from this very attenuated blood-supply is, however, so small that it is never sufficient to maintain the vitality of the ganglion cells, which die very shortly after their blood-supply is cut off. This explains the futility of any treatment in these cases after the first few hours. In the case already mentioned, where the attempt to move on the plug from the main artery to a peripheral one by means of massage and amyl nitrite, was successful, it was too late to restore the function of the retinal cells. When the patient has recovered from one or more short periods of temporary blindness in one eye, the treatment resolves itself into effort to prevent further disease of the vascular walls or of the nervous mechanism controlling them.

INSURANCE AND MATERIAL FACTS.

PERSONS who take out a policy of insurance are often puzzled to know how much information they should volunteer in answering the questions on the proposal form. They are probably aware that the law regards a contract of insurance as one in which the utmost good faith is essential. If there has been any concealment or misrepresentation of a material fact the contract becomes void. But it is not easy to know what facts the law will deem to be material. The answer depends on what a jury (or a judge exercising the functions of a jury) thinks as to whether the matter concealed or misrepresented would have influenced the mind of a reasonable and prudent insurer in the direction of either accepting or declining the risk. The point is neatly illustrated by a recent case in the Manchester County Court, reported in the *Solicitors' Journal.* A motorist had had two accidents through sudden illness causing him to lose control of his car. He claimed under his insurance policy, but it came to the knowledge of the insurance company that, since the war, he had occasionally suffered from attacks of biliousness which incapacitated him for the space of about an hour. His proposal form had included a question asking whether he or his chauffeur suffered from any physical infirmity; to this he had answered in the negative. The insurance company, regarding this as the non-disclosure of a material fact, sued him for the repayment of £56. The motorist explained that, when filling up the proposal form, he had not thought it necessary to mention the bilious attacks; he assumed that "physical infirmity" meant physical disability such as the loss of a limb; he said that, if he had been asked about his general health, he would have told the company about the biliousness though he regarded it as trivial at the time. The court held that the motorist's answer on the proposal form had been a true one. He had never suffered from these attacks until he left the army; he had had only four such attacks before signing the proposal form; it was seven years between the last attack and the date of the signature. The plaintiff company, the judge said, had not proved its case, but had been right to raise the issue which was a matter of public importance; there was a danger of proposal forms being too carelessly filled up, and also a danger of persons driving who were liable to lose control through no fault of their own. In our view an insurance company may be pardoned for regarding as a material fact a motorist's peculiar liability to sudden incapacitating illness. The learned judge, however, took a different view. As his decision is a decision on a question of fact, it is the more difficult to upset on appeal.

CHEMICAL BLOOD CHANGES IN ILEUS.

THE cause of death in ileus has long been debated. In a recent paper[1] Rudolf Brandberg traces the growth of the view that in experimental strangulation of the intestine death is due to intoxication from gangrenous bowel tissue alone or in conjunction with peritonitis. He notes that increasing support has lately been given to the theory that the chief lethal factor, at least in high obstruction where serious damage to the wall of the intestine is absent, lies in the loss of mineral substances and fluid. The idea underlying this theory is that the secretions discharged into the upper portion of the alimentary canal cannot be reabsorbed, and so are lost to the body. The normal amount of fluid excreted daily into the upper portion of the alimentary tract and reabsorbed in the lower is estimated to be equivalent in volume to the total amount of blood and lymph in the body, so that in high obstruction the mineral and fluid loss might be very great. These losses lead to chemical changes in the blood, particularly a reduction of chlorides, chiefly through loss of gastric juice, and an increase of non-protein nitrogen produced by loss of fluid. A series of experiments in rabbits have led Dr. Brandberg to favour this hypothesis. Animals with simple obstruction of the upper gastro-intestinal tract die very soon, and show at autopsy no important changes besides distension of the intestines above the obstruction. Examination of the blood between the time of operation and death shows a progressive fall in the blood chlorides and rise in the non-protein nitrogen, which changes coincide with extensive fluid and mineral loss. In pyloric obstruction copious quantities of chlorides are lost (about 600 mg.), but only small amounts of fixed alkalies (100 mg.). When the obstruction is just below the entrance of the bile and pancreatic ducts, the chloride loss is increased by barely 50 per cent., while the loss of fixed alkali rises to seven times the previous amount. This is probably the explanation of the old observation that obstruction at this point is most rapidly fatal. Towards the lower end of the small intestine obstruction causes much less fluid loss, because a certain area for reabsorption is available. Obstruction of the large intestine does not result in any appreciable loss of fluid or mineral substance, but all the animals were found at autopsy to have peritonitis arising from gangrene due to over-distension of the large intestine.

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[1] E. Coats: Royal Lond. Oph. Hosp. Reports, 1913. J. Rubert: Ophthalmoscope, 1914, p. 499.

[1] Acta Chir. Scand., 1929, lxv., 415.

Dr. Brandberg has also investigated the blood chlorides and non-protein nitrogen in 36 cases of human ileus. Three cases of ileus of the stomach and duodenum showed on the third or fourth day of the disease a distinct non-protein nitrogen rise and chloride reduction. In 13 cases of obstruction of the small intestine a non-protein nitrogen rise could be demonstrated after two days, in 16 cases of strangulated hernia containing small intestine the non-protein nitrogen rise did not usually appear until the fourth day; in none of these 29 cases could any definite chloride reduction be demonstrated. In four cases of obstruction of the large intestine no blood changes occurred even after several days. The author emphasises the importance of knowing that in high intestinal obstruction a high non-protein nitrogen may be found in the blood so that an unjustifiable diagnosis of renal disease may be avoided. He does not contend that clinical examination of the blood is of much use in the diagnosis of intestinal obstruction, because the diagnosis should mostly have been made before these changes occur. The same changes may be manifest when either chloride or fluid is lost from other causes than obstruction. He suggests, however, that variations in non-protein nitrogen and in chlorides may have value in showing whether an obstruction has been successfully relieved at operation, for if continuity of the lumen has been re-established the biochemical abnormalities disappear; otherwise they become more pronounced. These investigations give additional justification for the subcutaneous administration of sodium chloride solution in intestinal obstruction, and indicate that larger quantities than are usually given might be tried.

BIOLOGICAL DIAGNOSIS OF PREGNANCY.

INQUIRIES have reached us from practitioners anxious to know where they can send specimens of urine for diagnosis of pregnancy, since the Zondek-Aschheim test is not yet at the stage where clinical pathologists accept material for investigation as part of their routine work. We understand that Dr. Dickens and Mr. Allan, who recorded a high percentage of informative results in last week's LANCET, do not undertake private work. However, we would recall to our readers a request made by Prof. F. A. E. Crew in THE LANCET of March 30th, 1929, for specimens for diagnosis. His requirements are 2 oz. of fresh morning urine in a chemically clean bottle enclosed in a package that will withstand the dangers of the journey and accompanied by the following information: Date of last menstrual period; parity; menstrual history; history of any severe medical disturbances. To cover the cost of the mice a charge of 5*s.* for private cases and 1*s.* 6*d.* for institutional cases is made; a postal order should therefore be enclosed in the package, which should be addressed to the Pregnancy Diagnosis Station, The University, King's Buildings, Edinburgh.

THE BRIGHTON EPIDEMIC.

THE people of Brighton and Hove have been suffering for some weeks from a distressing epidemic of sore-throats, which is now happily abating. The clinical course and the pathological features in typical and atypical cases are detailed by Dr. O. Wilberforce and Dr. Mary Leslie-Smith on another page. The onset has generally been sudden, with a temperature of 100° F. to 103° F., pain and swelling of the tonsils and cervical glands, and intense headache. Relapses after four or five days of normal temperature have been frequent. Fortunately chest complications have not been a feature of the epidemic. A heavy growth of a long chained hæmolytic streptococcus has been obtained in nearly pure culture from the throats of many of the victims, from peritoneal and empyema fluids, from the blood, and from a suppurating phlebitis. The search for the cause of the epidemic has been made by medical officers sent for the purpose by the Ministry of Health, working in coöperation with Dr. Rutherford Cramb, deputy medical officer of health for Brighton, and Dr. A. Griffith, medical officer of health for Hove. Dr. Cramb and Dr. Griffith stated on Jan. 5th that inquiry had been made into all probable causes, including the milk-supply. These pointed to the milk-supply from one dairy being infected. By examination of the milk from each farm serving milk to this dairy the infection was traced to a farm about 15 miles away. The milk from this farm was stopped on Dec. 28th. Since this statement was issued medical officers from the Ministry of Health have been endeavouring to trace the source of infection at the farm and the way in which the milk became contaminated. Swabs have been taken from individuals working at the farm and from cows, and the results should be known shortly. Meanwhile no fresh cases have been reported except among those in contact with sick people, and there is good ground for the hope that no more will occur.

AN ŒSTRUS-PRODUCING HORMONE IN CRYSTALLINE FORM.

FURTHER details of the new crystalline œstrus-producing hormone, whose isolation was noted by our Berlin correspondent last week, have now reached us. E. A. Doisy, at the Thirteenth Physiological Congress at Boston (August, 1929), briefly announced the preparation of a crystalline substance from the urine of pregnant women, of which about one-eight millionth of a gramme constituted one mouse unit. Now Dr. A. Butenandt, working in the Chemical Laboratory at Göttingen University, of which Prof. Windaus is director, gives some preliminary details of researches which have led to a similar result.[1] The full chemical and physiological work will follow in a forthcoming publication, but sufficient information is now available to show that the work is of great interest. The material from which the first start was made was a crude oil commercially prepared from urine of pregnancy, which had an average activity of some 30,000 mouse-units per gramme. A preliminary purification was carried out by distribution between two solvents for example, the aqueous-alcoholic solution was shaken with petroleum ether. A similar method has been used by Doisy.[2] The hormone remains in the aqueous-alcohol phase from which it may be shaken out with ether, benzene, or ethyl acetate. In this way the activity of the preparation is increased up to 500,000 mouse-units per gramme, and impurities are removed. At this stage systematic precipitation and adsorption having been found of no great use in increasing the purity, the action of acids and alkalies was tried. The fact that a part of the hormone can always be removed from its ether solution with alkali (cf. H. Allan, F. Dickens, E. C. Dodds, and F. O. Howitt[3]), leaving a residue in the ether which is insoluble in alkali, whereas the hormone in the aqueous alkaline extract after acidification can easily be extracted with ether, suggested to Dr. Butenandt the probability that the active principle is a lactone.

Working on this idea he arrived at a new process of purification. Neutral impurities are shaken out from the alkaline solution with ether, and the contaminating acidic substances remaining are removed by weak alkali. By the use of such methods he has obtained the substance as an alkali-soluble oil containing 1½ to 2 million mouse-units per gramme. The final stage of purification consists of distillation in a high vacuum and sublimation in vacuo or crystallisation from solvents. The hormone distils over in a vacuum of 0·02 to 0·03 mm. Hg at a temperature of 130-150°C., and then contains 5 million mouse-units per gramme. Long sublimation in high vacuum or treatment with solvents yields a well-crystallised material which, even after repeated recrystallisation retains its high activity of 8 million mouse-units per gramme. This means that 0·000125 mg. in a single injection (dissolved in sesame oil), brings a castrated mouse into the œstral state. The author considers that he has been successful in preparing the female sexual hormone in the pure crystalline state. The name "progynon" has been given by him to the crystalline substance of which the physical and chemical properties are as follows. It has the solubility characteristics of a lipoid. It is easily soluble in alcohol, acetone, chloroform, benzene, and hot ethyl acetate; it dissolves with more difficulty in cold ether, and sparingly in petroleum ether or in water. By sublimation it is obtained in beautiful, snow-like crystals. It may be crystallised from ethyl-acetate or dilute alcohol in colourless leaflets of characteristic shape, melting with slight decomposition above 240°. Progynon contains no nitrogen or sulphur, and the analysis and molecular-weight determinations suggest the formulæ $C_{23}H_{28}O_3$ or $C_{24}H_{33}O_3$. Chemical tests show that it has no protein or carbohydrate groupings, and it is considered that sterols or bile-acids represent possible constitutions. The solubilities and behaviour with acids and alkalis suggest a lactone constitution, whilst biological inactivation by phenyl cyanate is considered to be accounted for by the formation of a urethane (not isolated), which is inactive. Hydrogenation also destroys the activity.

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[1] Butenandt, A.: Die Naturwissenschaften, 1929, xvii., 879; Deutsche med. Woch., Dec. 27th, 1929, p. 2171.

[2] Jour. Biol. Chem., 1926, lxix., 357: 1928, lxxix., 53.

[3] Biochem. Jour., 1928, xxii., 1526.

The constitution of progynon stimulates interest in the researches of S. Loewe[4] and M. Dohrn[5] on substances which are claimed to have similar activities obtained from the vegetable kingdom are of interest, since lactones of this type are known to occur in plant tissues. These plant extracts, however, apart from some doubt as to their biological action, are oily substances. Up to the present, crystalline lactones from plant sources have been tried for their action on ovariectomised mice, but, up to the present, have been found inactive. The biological standardisation of progynon was carried out carefully on a number of mice (16 to 18), showing a continuous resting stage (i.e., diœstrus), by injection of the solution of progynon in sesame oil in a single dose. The reaction was taken as positive when 75 per cent. of the animals used showed a full œstral response.

MENTAL STRESSES OF SCHOOL LIFE.

To the eighteenth annual conference of educational associations, held at University College during the first week of January, the National Council for Mental Hygiene added its contribution by a discussion on preventable mental and physical strains of school life. Some people deprecate the fuss that is made over children nowadays, arguing that what was good enough for their parents should be good enough for the young, but Dr. W. Moodie maintained that the school-child of to-day is unusual and does demand special methods if the nation's mental health is to be established. Many of the emotional problems he mentioned have always been with us: the changes in outlook accompanying puberty, for instance, the emotional charge associated with the first sex knowledge, the effects of sex jealousy, and the death of relatives. The highly intelligent child of a poor home, worse dressed and supplied with less pocket money than his fellows, had always had to wrestle with the inferiority which he shares with the dull child. The child of unequally developed capacities—always, in Dr. Moodie's opinion, the result of some inborn difficulty which can be recognised and treated—has always suffered under the stereotyped curriculum. Nevertheless, to all these difficulties there is added a new factor for the war-baby and the air-raid baby, a factor which can best be summed up as a lack of that fundamental sense of security which is so essential for adequate adaptation to the environment. Man, it has been well said, differs from the animals chiefly in the long period for which he is dependent, and the growth of civilisation has steadily increased that period and in many ways made it lifelong. The division of labour on which modern states are founded makes all of us dependent on our fellows for important supplies, and we have all learned how to be dependent by the steady evolution of a most delicate sensitiveness to the feelings of others. Children have a peculiar power of "picking up an atmosphere," of realising the emotional attitudes of the adults around them. The children in our upper forms to-day were introduced into a world of disruption, anxiety, and insecurity, and they have absorbed that atmosphere into their very beings. Many of them have suffered from an inconsistent home discipline, almost unknown in the placid father-ruled homes of the last century. When they come to the alien environment and discipline of school they find it hard to adapt. Another new difficulty, pointed out by Dr. Doris Odlum, is the hostility towards the school often openly expressed by parents whose hopes for their offspring have been disappointed. This subjects the child to the stress of a divided loyalty, which is peculiarly distressing. The new organisations which strive to bring parent and teacher together will do something to prevent this lamentable state of affairs. Both Dr. Odlum and Dr. Crichton Miller attacked the school system as another source of strain: the high demand for intellectual achievement, the standardisation, the boredom of pseudo-fatigue induced by emphasis on book work, and the lack of frequent rest-pauses in a long day. Modern school inspection has gone far towards abolishing the physical stresses, but bad posture, defective vision, and toxæmia still have a place among the preventable stresses of school life. Even if the child is well looked after in school it often has to do homework in a bad light and a cramped position, amidst endless distractions. Dr. Odlum did not forget that, difficult as it may be to be a good parent, it is still harder to be a good teacher, and the task calls for an ability to subordinate his or her own personality entirely to the interests of the children—no mean demand.

Both Dr. Moodie and Dr. Crichton Miller emphasised the oft-forgotten truth that all these stresses may have positive value. No two children are alike or react alike, and a strain that will crush one child will be the making of another. The primary necessity is to recognise the individual misfits as they arise. Dr. Moodie pointed out the interesting fact that a sudden depreciation in the calculating power of a child is almost invariably due to an emotional problem and should always be a psychological danger sign. The child can only be educated as an individual, and this means the growth of a new spirit rather than any specific change in curriculum. If preventable stresses are constructively dealt with the personal problems of the children can be trusted to cure themselves.

MANCHESTER HOSPITALS.—The annual statement of the Manchester Voluntary Hospitals Committee deals with 17 hospitals and dispensaries. The ordinary expenditure of the year was £315,000, but extensions and other special outgoings increased the total to £340,000, which left a net deficit of £28,000. The annual subscriptions amounted to nearly £10,000 more than in 1924. Manchester Corporation contributed £8000 per annum to the support of these institutions, the largest grant being £2000 to the Royal Infirmary. Patients paid just on £18,000, and various public authorities contributed £34,000 in respect of other patients. The aggregate number of beds is 2160, 1883 of which are in average daily occupation. At the end of 1928 the accumulated deficiencies of the institutions amounted to £117,000.

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[4] Loowe, S.: Biochem. Zeitschr., 1927, clxxx., 1.

[5] Dohrn, M.: Med. Klin., 1928, No. 36, 1437.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCXCVIII.

TREATMENT OF THE TYPHOID FEVERS.

PART II.*

Drugs.

FEW drugs are required in the routine treatment of typhoid fever. Hexamine is held to have a disinfectant action on bile, pancreatic juice, and urine; and for this reason it is good practice to prescribe it from the beginning of the second week onwards. A dose of grs. 20 or more is given three times in the 24 hours, together with sufficient alkali, say an equal quantity of sodium citrate and sodium bicarbonate, to make the urine strongly alkaline in reaction, lest strangury and hæmaturia result. The reaction of each specimen, as soon as it is passed, is tested with litmus and the dose of alkali adjusted accordingly. If signs of cholecystitis arise ten doses of hexamine, each of grs. 20, with sufficient alkali, are administered in the 24 hours, and antiphlogistine is applied over the gall-bladder region.

In an alcoholic subject it is advisable to allow whisky or champagne throughout the illness. The majority of patients do not require alcohol at any stage, but the drug is to be employed when the pulse frequency is increasing (apart from hæmorrhage) and the volume is small, and when signs of pulmonary congestion are present, but the effects of its administration on pulse and respiration must be carefully watched. It is best given as brandy or whisky; for a patient not addicted to alcohol an initial dose of two teaspoonfuls in an equal quantity of water every three hours, i.e., 2 oz. in 24 hours, will suffice. When the effect is beneficial the dose may be cautiously increased to 5 or 6 oz. in the 24 hours. One ounce of brandy at night may relieve delirium and induce sleep in appropriate cases. Brandy is also given when a rigor occurs during the disease. It is never added to a feed lest the whole of the prescribed dose be not taken.

Specific Treatment.

Specific therapy has a very limited field in typhoid fever. Serum of convalescent patients, in doses of 5, 10, or 20 c.cm. intramuscularly is advocated by Pezzi (*Riforma Med.*, 1922, xxxviii., 80). Vaccine both raw and sensitised has been employed. Achard recommends two or three doses of vaccine subcutaneously in the first few days, especially for children. Vaccine has been given intravenously. Gay (Typhoid Fever, New York, 1918) states that the milder cases of the disease react better to the treatment than the more severe, but even the most serious will, in some instances at least, be benefited and even aborted. The initial dose is 150 million; a chill follows the injection in from 15 minutes to an hour, and is accompanied by a rise in temperature of one to three degrees; within 12 hours the temperature may fall to normal with sweating, and usually improvement in such symptoms as headache and delirium is noticed. If the temperature again rises over a period of two or three days, a slightly increased dose is given. In Gay's series of 98 cases, one-third were aborted, one-third benefited, and the remainder were unaffected. The present writer has no experience of these "shock tactics" in typhoid fever, and the method has not been generally adopted.

In certain complications due to the specific organism of typhoid fever vaccine is undoubtedly of value; especially is this so in osteoperiostitis, chronic cholecystitis, and pyelitis. A dose of five million is given subcutaneously at the first sign of periostitis, and the dose doubled if need be five days later, heat meanwhile being applied to the part. Vaccine should be avoided in the presence of thrombophlebitis.

Certain Symptoms.

Severe toxæmia, headache, delirium, restlessness, and insomnia may be helped by hydrotherapy. The cold bath, under ordinary conditions, necessitates considerable disturbance to the patient, but when facilities exist it is to be recommended. The patient is let down into the bath on a stretcher or slung in a blanket, the temperature of the water being lowered from 95° F. to 70° F. or 65° F. by pouring cooler water over the neck and shoulders, 15 to 20 minutes being occupied in the process.

The cold pack is to be preferred in most cases; it may be given as follows:—

The patient is rolled on to a mackintosh covered with a blanket, and a towel is arranged around the hips; the bedclothes are removed, and the patient is covered with a blanket. Two large sheets are each folded into four thicknesses, and rung out of water at a temperature of 65° F. The blanket covering the patient is removed, one sheet passed under the patient, brought up round the body inside the arms and enveloping the legs; the second is applied to the front and tucked round the arms and neck; a warm bottle is applied to the feet. The patient is then covered with a blanket for five minutes, when the process is repeated; if the patient is very restless the sheets may be sprinkled with cold water instead of being removed. At the conclusion the patient is dried quickly, and the clothing replaced. The cold pack must not be given to feeble individuals or to the aged.

Antipyretic drugs are to be avoided in typhoid fever; the cold pack is the safest method to employ when hyperpyrexia is present. Severe headache, not relieved by hydrotherapy, is an indication for lumbar puncture. In toxæmia the drinking of water is to be specially encouraged. Insomnia, when not due to headache, may be relieved by bromide and chloral, say, grs. 30 of the former and grs. 10 of the latter, repeated hourly if necessary for four doses; when headache is the cause Dover's powder with aspirin is often efficacious.

Certain Complications.

Hæmorrhage.—Small hæmorrhages may occur from congested Peyer's patches towards the end of the first week; they are usually of no consequence. Large hæmorrhage from the erosion of a vessel in the base of an ulcer is rare before the eighteenth day. When a large hæmorrhage occurs, as may be shown by the presence of blood in the stool, and (or) by pallor, a drop in temperature with a rising pulse frequency, sweating, and shallow sighing respiration, the patient is kept absolutely quiet, and all food is withheld for 24 hours. Morphia is given hypodermically at once, and repeated as often as is necessary to keep the patient under its influence. The disadvantage of morphia (and heroin) in such circumstances is that if perforation follows the early signs are apt to be masked; the rapid sequence, though not very frequent, must be borne in mind. If the pulse is very small in volume, the foot of the bed is raised on blocks, and the extremities bandaged from below upwards. The patient is not to be put on a bed-pan, any discharge from the bowel being collected on tow. If peristalsis is active, it should be checked by a starch and opium enema (tr. opii ½ drachm in starch suspension 4 oz.). It is the custom to apply cold to the abdomen either by means of a Leiter coil or by an ice-bag suspended from a cradle; in either case the skin must be protected with flannel.

When a large hæmorrhage has taken place blood transfusion from a donor of the same blood group is probably the most valuable hæmostatic; it not only replaces a part of the blood lost, but it also increases the rate of blood-clotting. Not more than 300 c.cm. should be given at one time. Surgery has no place in the treatment of intestinal hæmorrhage in typhoid fever.

Perforation.—Treatment of perforation is immediate laparotomy. When perforation is suspected it is safer to explore than to await developments; in any case morphia is withheld until operation is decided on. A combination of local and general anæsthesia is recommended. The abdominal wall around the site of the proposed incision is thoroughly infiltrated with 0·5 per cent. novocain and 1 : 200,000 adrenalin; before the peritoneum is opened the subperitoneal tissue is similarly treated and the induction of nitrous oxide and oxygen anæsthesia begun. This procedure gives quite sufficient anæsthesia and is the safest under the circumstances. The incision is suprapubic, slightly to the right of the mid-line. The perforation is sewn up by Lembert's sutures; any fluid is withdrawn from the peritoneal cavity by suction apparatus or, failing that, by gentle mopping with a gauze swab. A soft drainage-tube is inserted if the peritoneum has been much soiled. Blood transfusion is advisable during, or immediately after, the operation. Peritonitis may occur apart from perforation, especially in paratyphoid fever.

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* Part I. appeared last week.

Thrombophlebitis necessitates complete immobilisation of the limb by sand bags for a period of three weeks, after which gentle massage may be begun. The pain may be relieved by the local application of glycerin of belladonna, and the intravenous injection of grs. 20 of sodium citrate in 8 oz. of sterile water.

Ulceration of lymphoid tissue in the pharynx is a cause of dysphagia; the discomfort may be relieved by the use of a spray containing menthol grs. 3 and chloretone grs. 10 to the ounce of liquid paraffin.

Cardiac dilatation—as evidenced by outward movement of the apex-beat, softening and shortening of the first heart sound, and a falling blood pressure—if acute, calls for the intravenous injection of strophanthin grs. 1/200, repeated eight hourly if necessary, and the hypodermic administration of strychnine grs. 1/30 four hourly, alternately with pituitrin and adrenalin. Camphor grs. 3 in olive oil ♏15 is useful in an emergency, but is not suitable for repeated administration.

Meningitis, a rare complication, is treated by daily lumbar puncture; during the operation, for which a general anæsthetic is necessary if the patient be restless, the buttocks are raised slightly above the level of the head, and the fluid is allowed to flow so long as it will.

If *broncho-pneumonia* develops, the patient is given oxygen continuously by means of a No. 7 catheter passed through the nose. The catheter is changed every four hours, and the oxygen passes through the water in the Woulfe's bottle at such a speed that the bubbles can just be counted.

Bedsores readily form over pressure points when nursing is inefficient. When such complications as perforation and thrombosis arise to prevent frequent change in the patient's posture, especial care is necessary to avoid them—scrupulous cleanliness, drying the skin, hardening it with alcohol, and dusting with powder; when the skin is unusually dry lanoline may be substituted for powder. The draw-sheet is frequently changed and kept free from creases. The warning sign is a permanent redness of the skin; the area is then painted with collodion flexile. An abrasion is dressed with an emulsion of zinc oxide in castor oil, or dusted with bismuth formic iodide powder every two or three hours. An ulcer is fomented until sloughs have separated; the part is then dusted with B.F.I. powder and a smooth dry dressing applied and frequently changed.

A. E. GOW, M.D., F.R.C.P. Lond.,
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THE following articles in this series have appeared since the last collection was published as Modern Technique in Treatment, Vol. IV. :—

THE LANCET, 1928, Vol. II.: Treatment of Gastric and Duodenal Ulcer after Subsidence of Acute Symptoms, by Dr. T. Izod Bennett (p. 882). Treatment of Acute Hæmatogenous Osteomyelitis, by Mr. Harry Platt (p. 1305).

(*Continued at foot of next column.*)

Special Articles.

MATERNAL MORTALITY
IN THE OBSTETRICAL AND GYNÆCOLOGICAL UNIT, ROYAL FREE HOSPITAL.

By DAME LOUISE McILROY, D.B.E., M.D.,
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AND
BEATRICE TURNER, F.R.C.S. EDIN.,
OBSTETRIC REGISTRAR, ROYAL FREE HOSPITAL.

As so much public discussion has taken place lately on the subject of maternal mortality, it may be of interest to give the death-rate of mothers in a teaching hospital, and also an analysis of the causes of death. The Royal Free Hospital has 46 obstetric beds, and a district close to the hospital and a district clinic in Islington. About 90 per cent. of the patients are booked for admission from the antenatal clinics, and at the most about 10 per cent. are sent in as emergency cases. The cases of puerperal sepsis are treated in a ward completely isolated from the main block of wards, and there is an isolated department of five beds for obstetric patients with venereal disease. The cases of sepsis are treated by the senior staff, and the gynæcological house surgeon and gynæcological clerks only are in attendance. The students have three months as gynæcological clerks, non-resident, and three months residence as obstetrical clerks. The first month of clinical obstetrics is spent in the wards only, the second month at the district centre, and the third month in the hospital district and V.D. ward. There is a resident assistant who acts as tutor to the junior clerks. The clerks must personally deliver the cases for which they are signed up. The director, second and third assistants are whole-time officers, the first assistant is part-time. The assistant staff changes every two years, but the senior posts are filled up by candidates from the junior posts. There is, therefore, not the same continuity of treatment for patients as is obtained in hospitals where the staff remain for years. It is, however, one of the aims of the unit system to enable a larger number of young graduates to obtain experience in obstetric and gynæcological practice.

No. of Maternity Patients Delivered from Oct. 1st, 1921, to Oct. 1st, 1929.

Year.	In-patients.	District patients.	Total.	Deaths.
1921–1922	684	315	999	3
1922–1923	883	271	1154	2
1923–1924	944	217	1161	4
1924–1925	765	212	977	2
1925–1926	839	349	1188	4
1926–1927	778	435	1213	5
1927–1928	795	482	1277	2
1928–1929	929	570	1199	4
Total ..	6617	2951	9168	26

Total patients delivered in eight years = 9168.
Maternal deaths = 26. Maternal mortality-rate = 2·7 per 1000.

This maternal mortality report is based on deaths which have occurred during a period of eight years. 1921–29, and includes both in-patients and district patients. Although no deaths occurred in the

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(*Continued from opposite column.*)

THE LANCET, 1929, Vol. I.: Treatment of the Broken Nose, by Mr. H. D. Gillies and Mr. T. P. Kilner (p. 147). Ambulatory Treatment of Piles, by Mr. W. S. Perrin (p. 569). Treatment of Vulvar and Anal Eczema, by Dr. Agnes Savill (pp. 679 and 731). Treatment of Low Blood Pressure, by Dr. E. Noble Chamberlain (p. 889). Prophylactic Treatment of Measles, by Dr. D. N. Nabarro and Dr. A. Signy (p. 1106). Treatment of Empyema, by Dr. L. S. T. Burrell (p. 1265).

THE LANCET, 1929, Vol. II : Treatment of Sterility in Women by Miss F. M. Huxley (pp. 138 and 186).

district, this may be accounted for by the fact that any patient seen at the district antenatal clinics with an obstetric complication is admitted when possible to the hospital for confinement.

Analysis of Cases of Maternal Deaths.

Six cases of death were attributed to obstetric shock, four to shock from hæmorrhage, six to sepsis, two to embolus, four to toxæmia and eclampsia, one to broncho-pneumonia, and one to acute appendicitis. The details of each of these cases are as follows.

Obstetric Shock.

1. Prim., aged 29. First seen 16th week. Previous health good. Pregnancy—carious teeth, slight œdema of legs, no albumin. Treated as antenatal out-patient. Delivery spontaneous at term. Labour: first stage, 27 hours; second stage, 2 hours; third stage, 40 minutes. Cervix rigid. Twins. P.P.H. Died 30 minutes after delivery from shock. Infants well.

2. Prim., 21. First seen 20th week. Had several attacks of bronchitis. Pregnancy—1 carious tooth. Second cardiac sound reduplicated. Treated as O.P. Delivery spontaneous at term. Labour: first stage, 35 hours; second stage, 2 hours; third stage, 1 hour. Cervix rigid. P.P.H. Died 15 hours after delivery from shock. P.M.: Fatty heart, old pleurisy and consolidation. Infant well.

3. Multip. (3), 26. First seen 12th week. First labour, forceps, craniotomy; second and third, Cæsarean section. Pelvis contracted. Toxæmia. Treated as antenatal in-patient and out-patient. Teeth good. C.S. performed at term. No complications, no hæmorrhage. Patient very excited some hours after, pulse feeble. Died in ten hours of obstetric shock. Infant well.

4. Prim., 33. Admitted as emergency for obstructed labour at term. First stage, 60 hours; second stage, 8 hours; third stage, ½ hour. Forceps. Craniotomy for disproportion. Dead fœtus. Sudden collapse and death. Obstetric shock.

5. Prim., 32. Induction at 38th week; rubber tube for disproportion. Cervix rigid, long labour, death of fœtus in uterus, craniotomy. Sudden collapse after delivery; death. Obstetric shock. P.M.: Fatty heart.

6. Multip. (3), 37. First seen 16th week, abnormally fat. Teeth good. Previous labours long, forceps; children, average weight 12–13 lb. Œdema, breathless, induction 38th week, rubber tube. Long labour. Forceps failed. Perforation. Cæsarean section, as delivery thought to be impossible. Dead fœtus. Died 3¾ hours later from obstetric shock.

Shock from Hæmorrhage.

7. Multip. (8), 41. Admitted as emergency 28th week. Severe hæmorrhage. Placenta prævia. Not in labour. Died 24 hours after admission. Shock from hæmorrhage. Not delivered. Packing. Version.

8. Multip. (2), 40. Admitted as emergency at term for severe collapse and abdominal pain. Intra-abdominal distension, signs of hæmorrhage, not in labour. Abdominal operation, cavity full of free blood, dead fœtus in cavity, ruptured interstitial pregnancy. Hysterectomy. Patient died shortly after, from shock, following hæmorrhage. Infant dead.

9. Prim., 36. Admitted as emergency near term. Severe A.P.H. Central placenta prævia. Not in labour. Cæsarean section. Secondary hæmorrhage later. Died in 17 hours from shock, following hæmorrhage. Stillbirth.

10. Multip. (5), 37. First seen 26th week, some toxæmia Previous labours normal. Had slight A.P.H. Placenta prævia, in ward one month before term. Further hæmorrhage, version about to be performed. Patient died under anæsthesia. Heart failure. Shock following hæmorrhage. P.M.: Fatty heart only found.

Sepsis.

11. Multip. (3), 37. First seen 37th week. A.P.H. Placenta prævia, not in labour. Carious teeth, systolic murmur. Packing. Version. Labour 1 hour 20 minutes. Sepsis. Broncho-pneumonia. Died 22nd day after delivery. Infant lived 14 hours.

12. Multip. (4), 32. First seen 36th week. Had sepsis second confinement. Contracted pelvis. Teeth artificial. Induction by rubber tube. Labour: first stage, 4 days; second stage, 2 hours; third stage, few minutes. Sepsis, jaundice, broncho-pneumonia. Death 21 days after delivery. Stillbirth.

13. Multip. (5), 40. Emergency, abortion at 4½ months, 28 days previously. Placenta retained, foul discharge, rigors, carious teeth, placenta removed. Died from sepsis 28 days after admission.

14. Prim., 25. First seen 37th week. Previous health good except rickets, flat pelvis, carious teeth. C.S. at term, no complications. General peritonitis. Death 17 days after operation. Infant well.

15. Prim., 20. First seen 36th week. Previous health good. Teeth carious. Ovarian cyst. Removed two days later. Labour began two days after. Delivery by forceps. First stage, 7 hours; second stage, 2 hours; third stage, 5 minutes. Died third day after delivery, peritonitis. Infant premature, stillbirth.

16. Prim., 25. First seen 16th week. Flat small pelvis. Teeth artificial. Septic sinus in knee from old operation for patellar complication. Treated during pregnancy, healed before term. C.S. after test labour. Died sixth day; general peritonitis. Infant well.

Embolus.

17. Multip. (1) (stillbirth), 35. First seen 34th week Previous health bad. Malaria, dysentery. During pregnancy had anæmia and diarrhœa. Exhaustion early in labour. C.S. at term, no complications. Slight pyrexia first week, normal temperature second week. Sudden collapse; died in few hours, 13 days after delivery. Pulmonary embolus. Infant well.

18. Prim., 38. First seen 14th week. Very nervous. Carious teeth. Toxæmia, later had persistent vomiting. Treated in ward, much improved. Died suddenly 14 days after admission. Emboli found in lungs.

Toxæmia and Eclampsia.

19. Prim., 28. First seen 18th week. Had appendix removed *four years before. Carious teeth.* Small pelvis. Disproportion later. Labour at 38th week. Forceps delivery. First stage, 34 hours; second stage, 6 hours; third stage, 35 minutes. Rigid cervix. Exhaustion. Jaundice second day, comatose. Died of *acute toxæmia*, hepatic atrophy, fifth day after delivery. Stillbirth.

20. Multip. (1), 31. First seen 20th week. First child, breech, stillbirth, jaundice in puerperium. Generally contracted pelvis. Teeth good. Induction 38th week, rubber tube. Labour, forceps. Difficult extraction. First stage, 12 hours; second stage, 7 hours; third stage, 10 minutes. Vomiting, jaundice, melæna, collapse. Died six days after delivery of acute toxæmia. Stillbirth.

21. Prim., 22. First seen 32nd week. Previous health good; œdema legs and abdominal wall. Albumin. Labour at term. Spontaneous delivery. First stage, 11 hours; second stage, 5 hours; third stage, 10 minutes. Four fits occurred within 12 hours of delivery. Recovery. Five days later, sudden severe headache, comatose. Death in 12 hours, acute toxæmia. P.M.: Œdema of lungs and brain present. Uterine muscle healthy. Infant well.

22. Prim., 22. First seen 35th week. Positive Wassermann, no albumin. Teeth good. Delivery spontaneous at term. Labour: first stage, 8 hours; second stage, 1 hour; third stage, 20 minutes. Eclamptic fit two hours after delivery. Several fits, coma began after fourth fit. Died four hours after delivery, 27 fits in all. P.M.: Hæmorrhages in liver, fatty changes. Infant well.

Broncho-pneumonia.

23. Multip. (1), 33. First seen 26th week. Had C.S. previous confinement. Carious teeth. Contracted pelvis. Labour at term, long, spontaneous. First stage, 26 hours. second stage, 1 hour 10 minutes; third stage, 15 minutes; Influenza and broncho-pneumonia third day. Died tenth day after delivery. P.M.: Double empyema and consolidation both bases. No pelvic sepsis. Infant well.

Heart Disease.

24. *Multip. (3), 28. First seen 28th* week. Pneumonia five years before. Chronic bronchitis. Heart trouble three years. Admitted at once, breathless, cough, respiration, distressed. Œdema. Improved for a time on treatment. Died five days after admission, undelivered. P.M.: Mitral stenosis. Broncho-pneumonia both lungs.

Acute Appendicitis.

26. Prim., 27. Admitted as emergency. Thought to be A.P.H. concealed. Twenty-fourth week acute abdominal pain present several days. No evidence of hæmorrhage. Pyrexia, patient very ill. Distended abdomen. Under

anæsthesia. Swelling in right iliac fossa. Appendicitis diagnosed. Lateral incision, large quantity of pus evacuated, drained. Death few hours later. At P.M. perforated appendix found.

Remarks.

The total number of antenatal attendances between 1921 and 1929 was 49,047. Among the cases treated in hospital there were 77 cases of placenta prævia, 21 cases of eclampsia, 10 cases of craniotomy (fœtus dead in every case before operation), 476 cases of forceps, giving 5 per cent. of all deliveries, and 152 cases of Cæsarean section, giving 1·6 per cent of all deliveries.

Fœtal deaths.—The number of infants born alive was 9152; neonatal deaths, 145; total number of stillbirths, 366 (of these 199 were at term and 167 premature). There were 112 sets of twins (1·1 per cent. of all deliveries). Abortions and induction of abortions are not included in the present report, except in the one case (13) where maternal death occurred.

Maternal deaths.—An equal number of deaths occurred among the primiparæ and multiparæ. The primiparæ preponderate only in the toxæmia group. The greater number of deaths were due to obstetric shock, which included deaths due to hæmorrhage and heart failure. The cases of puerperal sepsis show that operative interference and complications at labour increase to a great extent the risk of sepsis. Two of the patients died from sepsis after Cæsarean section, one after an operation for ovarian cyst. Bronchopneumonia is a serious complication in sepsis. Any septic focus requires consideration. One of the patients suffered from a septic sinus of the knee. Carious teeth should be attended to in every patient undergoing an antenatal examination. Most cases of toxæmia have some dental sepsis. Extraction or dental treatment is carried out in over 70 per cent. of the patients treated in the antenatal clinics. No case of abortion can be traced to dental treatment, but many abortions owe their origin to caries of the teeth. Since the case of No. 13 treatment by immediate removal of the placenta has been abandoned, and the patient's immunity is raised by serum, quinine, and glycerin drainage before the placenta is taken away. Every attempt is made to prevent general infection. No deaths have occurred since this method of treatment has been adopted.

Deaths from accidental hæmorrhage are rare since antenatal treatment has been carried out. In some cases of toxæmia the condition is so acute and rapid that treatment is of little avail. The fulminating type of eclampsia is an example. A very large number of patients suffering from serious heart disease are treated in the maternity wards. The results will be published separately; their success is due to the early recognition and treatment of the condition. An antenatal heart clinic is held once a week; this was started by Dr. Dorothy Hare and is now under the care of Dr. Olive Rendel. The cases are carefully examined and, if necessary, are electrocardiographed by Dr. Jenner Hoskin and Dr. Rendel.

A number of pregnant women lose their lives not from obstetric complications alone, but from general diseases, such as nephritis, phthisis, &c. We feel strongly that a very large measure of our low maternal mortality is due to our advantage in being a department in a general hospital and not an isolated maternity institution. Every member of the staff has helped us to safeguard the lives of the mothers by efficient medical, surgical, dental, and electrical treatment. Our diagnosis is made much more accurate in antenatal cases by enlisting the skill of the staff of the X ray and pathological departments. Cases of toxæmia are recognised early by biochemical examinations made by Dr. Pillman Williams.

Criticism is often levelled at institutional treatment for obstetric patients and the risk of sepsis in segregated patients is emphasised. A study of this report should show that wherever any complication is foreseen in a pregnant woman the safest place for her is in the wards of a hospital.

A RECENT EPIDEMIC OF SORE-THROATS IN BRIGHTON AND HOVE.

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IN view of the conflicting accounts which have recently appeared in the lay press about the Brighton and Hove "mystery disease," it may be of interest to record the following facts in connexion with an epidemic which seems to have been rather widespread in this locality but is now happily coming to an end.

Onset.—Clinically the onset has been sudden and in the majority of cases characterised by flaming red painful throats. Some patients have enlarged tonsils which show patches, and have pain on swallowing, definite swelling of the tonsillar and cervical glands, a very dirty dry tongue, intense headache, and, occasionally, a sense of suffocation where the larynx has also been involved. With many patients the temperature has risen on the first day to about 103° F., in others a beginning temperature of 100° F. has been followed after 48 hours by a rise to 103° F. or more. The pulse in most cases has not been unduly rapid. Sleeplessness due to the intensity of the backache and painful throat and neck region has been a most distressing symptom. Pain in the limbs and headache have been not infrequent complaints, although often absent. A troublesome feature of the disease has been the frequency of relapse after four to five days of normal temperature. Sometimes the relapse has been demonstrated merely by exacerbation of fever and fresh swelling of the glands, in other cases by the formation of localised pus. The actual pain of the cellulitis in the neck region has commonly radiated up the side of the head, into the ear, or over the whole area of the trigeminal nerve, when it has been particularly prostrating. Chest complications have been surprisingly rare.

On the whole, adults have appeared to suffer more from a general septicæmia, whereas children have had more localised troubles with rather fewer relapses. In a well-to-do girls' school, where 23 out of 40 boarders were afflicted, only two girls became seriously ill—a somewhat surprising fact since an increased virulence is commonly expected as when a number of people live together as a community.

Atypical Cases.

Two cases are perhaps worth recording as being atypical.

CASE 1.—A woman, aged 57, who has Paget's disease (with typical skull X ray changes), sent for one of us (O.W.) on Dec. 1st. She had vomited profusely the previous day, felt very ill and collapsed, with severe abdominal pain, and complained also of a sore-throat. Her temperature was 98° F., pulse 100. Abdomen tense, distended and tender all over. Throat red, swollen, patches over both tonsils, and a dirty tongue. Throat swab culture was negative to K.L.B., but grew a long-chained hæmolytic streptococcus.

Dec. 2nd: Patient continued to be very ill, vomiting at intervals. Much difficulty in keeping anything down, abdomen still painful and distended, no rise of temperature, pulse 100. B.N.O. Poor result from soap enema. *3rd:* Temperature rose to 103° F., pulse 112, on her left cheek a small patch of erysipelas developed. *4th* and *5th:* She grew steadily worse. Temperature rose to 105·2° F., the rash spread over both eyes, cheeks, ears, scalp; she appeared very ill, and was delirious and incontinent. Two doses of antistreptococcal serum (erysipelas), B. W. & Co., were given on Dec. 8th and 9th, and by the 11th her evening temperature had dropped to 98·6° F., pulse 80. She left the nursing home on Dec. 21st with a perfectly clear skin, having had no relapse. She enjoyed a Christmas dinner, though considerably self-conscious at having lost all the hair from her head.

The death-rate from pulmonary tuberculosis was the same as in 1927 and compared favourably with the average rate for the past ten years, whilst the non-pulmonary tuberculosis rate was lower than ever before. Details are given of the successful operation of the county scheme during the year. Out of 9470 patients on the register 6122 received some form of treatment under the scheme. Every effort is made to keep the accommodation in the county sanatorium at Lenham for patients in the early stages of the disease. Dr. F. J. Pierce, the medical superintendent, reports that of the special forms of treatment artificial pneumothorax gave the most satisfactory results. Of the 380 patients discharged during the year 30·5 per cent. were classified as quiescent; 47·1 per cent. as improved; 20·0 per cent. as not materially improved; and 2·4 per cent. died in the institution. Arrangements are made with various hospitals in the county for X ray diagnosis and light treatment. Forty-five patients were treated by Finsen light for lupus and tuberculous skin diseases at London hospitals, and when necessary the county council provided travelling facilities and for the boarding out of patients near the hospital. Dr. Charles Roper, tuberculosis officer for the Rochester district, makes special reference to the difficulty in removing from the register patients who have been "labelled" as tuberculous and are really old-standing cases of pulmonary fibrosis, bronchiectasis, asthma, and chronic bronchitis. The number of patients attending the V.D. clinics for syphilis has been fairly constant during the past six years, but the numbers of gonorrhœa patients and patients with "diseases other than venereal" have shown a tendency to increase. The number of attendances has considerably increased, but 26 per cent. of the syphilis patients and 12 per cent. of the gonorrhœa patients cease attendance before completing the course of treatment.

The work of the county pathological laboratories has been much appreciated by the medical practitioners, and the total of 33,005 examinations exceeded the previous record by 4544. The county scheme for crippled children has 48 beds for tuberculous and 32 for non-tuberculous cripples at the Alexandra Hospital, Swanley, where education is provided for children of school age, while three other hospitals at Maidstone, Canterbury, and Dartford provide beds for short stay cases. These three hospitals have established seven out-patient clinics in various parts of the county which are attended by their orthopædic surgeons. The new patients attending these clinics during the year numbered 414. The new houses erected numbered 6617—a marked decline as compared with the previous year's figure of 9023. The shortage of houses is estimated at 5000—i.e., only a little better than it was five years ago.

Nottinghamshire.

Dr. Christopher Tibbits presents the report for a period during which he held only a partial responsibility, owing to the death of his predecessor, Dr. T. E. Holmes, after a short illness on Dec. 24th, 1928. He mentions that a new child welfare and school centre is to be established at Stapleford, and that provision has been made for the removal of the health department staff to more commodious premises. The increased work of the department calls for an enlarged staff. A difficulty has arisen owing to the shortage of midwives, nurses, and health visitors, and as a temporary solution pupil health visitors are being taken. The maternal mortality-rate is slightly in excess of the figure for the whole country and Dr. Tibbits puts among the urgent needs adequate antenatal supervision, with the services of consultants available; hospital provision for complicated cases and those in unsuitable homes; hospital beds for puerperal sepsis; an adequate rural midwifery service; and dental treatment for expectant mothers.

Most of the midwives in the county have acquired some proficiency in antenatal work. They are advised to persuade their patients to obtain medical antenatal examination at least once; and that they are alive to the importance of antenatal work is indicated by the fact that of the 1500 cases in which they summoned medical help during 1928 abnormalities of pregnancy were the reason in 288 instances. Notification of puerperal fever is incomplete. In 1928 there were 14 notifications and 13 deaths and in 1927 10 notifications and 12 deaths. A special report by one of the county consultants, Mr. A. M. Webber, F.R.C.S., gives the particulars of 10 county cases of puerperal pyrexia treated by him, mostly admitted to the General Hospital, Nottingham, with 3 deaths. As a rule in "positive blood cases" Mr. Webber finds blood transfusions give gratifying results but they did not do so in this particular series. Intrauterine glycerin douches gave successful results and anti-scarlet fever serum appeared to be beneficial. Dr. Webber points out that for these elaborate methods of treatment immediate admission to a hospital is essential.

The Ransom sanatorium maintained by the county council has 130 beds and more accommodation is needed, particularly for cases of early tuberculosis in female adults. Decision as to this and other matters is deferred owing to the pending transfer of institutions to the county council. Dr. Tibbits points out that a more comprehensive procedure is needed with regard to the Milk and Dairies Order. The county veterinary officers examined 3085 animals and found 160 (or 5 per cent.) suffering from tuberculosis. About half of them were cows in milk, and most of them were in an advanced stage of the disease. Four complaints were received from the L.C.C. as to tuberculous milk and in each case the source of infection was traced. The prevention of the pollution of rivers was pursued more effectively owing to the appointment of a full-time rivers' inspector. But there is very much more to be done before the streams of the county can be considered satisfactory. Dr. Tibbits deplores the fact that the streams are used for the disposal of all kinds of refuse and suggests that the Rural Community Council through its series of lectures and the schools might endeavour to prevent this state of affairs by stirring up local pride and jealousy for the preservation of rural amenities. Industrial concerns appear to be coöperating well but the treatment of the waste from the two beet sugar factories is still in the experimental stage, and among other sources of pollution needing attention are coal washings, oil and the effluent from paper mills. The hydrographical survey of the Trent during 1928 showed the dominating influence of the pollutions from the potteries, the River Tame, and the Burton areas with a gradual improvement below these points and until in the Nottinghamshire area the average oxygen saturation value becomes 83·5 per cent. Private enterprise mainly with State assistance was responsible for 80 per cent. of the new houses erected in 1928. Eight grants were approved amounting to £1490 under the Housing (Rural Workers) Act, 1926. One was for the conversion of an old manor house into three cottages, another for the conversion of a barn into four cottages, and six were for the improvement of old cottages.

Warwickshire.

Dr. A. Hamilton Wood's report shows that the epidemic of small-pox which began in the last quarter of 1927 continued during the early months of 1928, when 124 cases were notified and four deaths were registered. Immunisation schemes against diphtheria have not yet been introduced in the administrative county, although this preventive measure is being used in Birmingham and Coventry. There were 18 notifications of encephalitis lethargica and 15 deaths. There were two deaths at the period 1 to 2 years; two at 2 to 5; three deaths at 5 to 15; two at 15 to 25; one at 25 to 45; and five at 45 to 65.

Inquiries were held for improvement schemes for the sewage works of Nuneaton and Coventry. The county staff has made surveys of the rivers Tame and Avon and their tributaries in coöperation with the Ministry of Agriculture and Fisheries, and the attention of eight authorities has been drawn to defects in sewage disposal works. During the year 99 routine samples of milk were examined for tubercle, of which 10 were found to be infected. Fifty-one notifications of tubercle-infected milk were received, most from outside authorities, and as a result 29 cows were slaughtered under the Tuberculosis Order. There are three producers of "Certified" milk and four of "Grade A (T.T)." Of 79 samples of milk examined for the presence of dirt eight were unsatisfactory. Bramcote Sanatorium was used for advanced cases of tuberculosis until January, 1928, when it became needed for its original purpose—small-pox. Provision was then made of 40 beds for advanced cases of consumption at the Memorial Sanatorium, Warwick. Even with this accommodation there is a considerable waiting-list and probably some of the poor-law hospital accommodation will be utilised for this purpose after the transfer, with the additional advantage that the beds for the advanced cases will be brought nearer to the relatives. The extension of the boundaries of Coventry involved the transfer of 74 patients on the register. The seven dispensaries are managed by the Warwickshire and Coventry joint committee. The contacts examined are few in number, 323, but showed an increase over the 1927 figure of 266. Of the 323, nine were tuberculous and one doubtful. Seven of the patients attending these dispensaries were having artificial pneumothorax treatment. Since 1927 the joint committee has made arrangements for other operative treatment at a London hospital—viz., pneumolysis, division of the phrenic nerve, and thoracoplasty—and during the year one patient underwent pneumolysis and three thoracoplasty with satisfactory results up to the present. There were 25 notifications of puerperal sepsis with 13 deaths, but some of the 44 notifications of puerperal pyrexia were really sepsis cases, thereby reducing the high case fatality. The total births numbered 6099, and 306 expectant mothers were on the register of the five county antenatal clinics. Dr. Wood recommends the county council to compensate the midwives for the loss of fees resulting from sending their abnormal cases to the clinics.

The orthopædic scheme has been extended by the inclusion of the orthopædic hospital at Coleshill and the opening of the outclinics at Coleshill and Stratford-on-Avon. The needs of the north of the county are also being met by the establishment of an outclinic at Tamworth. The progress of the scheme is indicated by the increase of cases dealt with to 580 from 312 in the previous year.

Interest and enthusiasm in maternity and child welfare work has been stirred up during the last three years by the Warwickshire Federation of Infant Welfare Centres, and this federation has recognised the long service of the county superintendent of midwives and health visitors by providing an artistic bronze shield, "the Mildred Lowe Shield," for competition annually among the voluntary infant welfare centres. Dr. Wood describes the continuing housing activity as "indeed encouraging." Of the 2385 new houses, 1711 were State assisted, 600 provided by local authorities, and 1111 by other enterprise.

Gloucestershire.

Dr. J. Middleton Martin mentions as a sign of increasing interest in the M. & C.W. work the appointment of Dr. E. Catherine Morris Jones as assistant medical officer and the formation of a federation of welfare centres early in 1929. Up to now the number of centres, 29, is comparatively small, and it is hoped that the federation will be instrumental in opening many more. Progress has been made in the pooling of hospital accommodation, and further progress is expected in the districts to the west of the Severn. Adequate water-supplies are to be provided for two parts of the county badly in need of such—viz., Coleford urban and West Dean rural districts and Cleeve Hill in the Winchcombe R.D.

Temporary appointments have been made to fill two death vacancies with a view to effecting another combination of districts for the appointment of a whole-time medical officer of health. Such combinations at present cover two-thirds of the county, and there are 12 part-time medical officers of health for the remaining 14 districts.

The services of obstetric consultants have been extended to include difficult labour. During 1927 there were eight consultations for pyrexia and three for pregnancy and confinements, whilst during 1928 the figures were 10 and 4. Less reluctance is shown in taking advantage of in-patient treatment for confinements. Thus during the last four years the number of hospital admissions for confinements has increased gradually from 18 to 60; and during the last two years 13 cases were admitted for pyrexia. A tabular statement shows the development of the midwifery service since 1905. In 1905 there were 53 trained and 175 untrained midwives; in 1928 there were 235 trained and 17 untrained. In 1905 there were 174 parishes covered by district midwives; now 327 are covered. During 1921–25 the midwives sent for medical help in 25·1 per cent. of their cases; for 1926 the figure was 32·9 per cent.; for 1927, 34·0 per cent.; and for 1928, 39·2 per cent. Dr. Martin draws the conclusion that this rise indicates improved attendance on mothers and infants. During recent years the midwives have attended two-thirds of the mothers in the county in their confinements. In the investigation of the 23 maternal deaths, Dr. Martin mentions that he received the willing coöperation of the doctors, the principal assigned causes being puerperal fever, 9; eclampsia, 6; and postpartum hæmorrhage, 3. The chairman of the public health committee (Rev. R. H. M. Bouth) is also chairman of the County Association for the Blind, which administers the approved scheme. On March 31st, 1929, there were 591 blind on the register and 129 cases under observation. There are 105 voluntary workers, who keep in touch with the blind persons in their neighbourhood. The workshops for the blind at Cheltenham were taken over by the county council in April, 1928. The scheme for the extension of medical services has made further progress. There are now 12 outstations, and the hospital accommodation available in addition to the general hospitals at Bristol, Cheltenham, Gloucester, and Stroud includes three smaller institutions in other parts of the county. Twelve additional outstations are to be opened during the next three years. The patients treated increased from 316 in 1927 to 390 in 1928, largely owing to the opening of the new outstation at Lydney. Forty-nine cases were admitted to hospital for operative treatment and 10 per refitting, &c. Cases who have passed out of the scheme by reaching the age of 14 have been kept in touch with, and Dr. Martin pleads for an extension of the age limit. An extra orthopædic nurse has been appointed to ensure following up. The cases treated included flat feet, 89; bow legs, 75; infantile paralysis, 47; congenital talipes equino varus, 22; cleft palate and harelip, 14; and scoliosis, 13.

The estimated deficit of 6400 houses made in 1919 is being gradually reduced, but on the other hand little has yet been done to improve existing houses, and Dr. Martin thinks that in this direction lies the most useful opportunities for improving the general standard of housing. Such restorations require ingenuity in order to preserve local characteristics, and the Council for the Preservation of Rural England has established panels of architects, who are willing, without charge, to assist local authorities and others in the general preservation of the amenities of rural areas in connexion with the Housing (Rural Workers) Act. So far Gloucestershire has done very little under this Act. In 1927 there were 12 applications and four agreed grants; and in 1928 there were 9 applications and two agreed grants.

The county analyst's report shows that 74 out of 485 milk samples submitted were adulterated. This represents 15·3 per cent. and is very much higher than the figure for the whole country, which for the year 1927–28 was 6·9 per cent. The most serious case of adulteration was one where samples were taken in course of delivery under contract, and the four churns were found to contain 26·9 per cent., 19·1 per cent., 51·3 per cent., and 18·7 per cent. added water, and also to be deprived of about half of their cream. This vendor was fined £10 in each case and £14 14*s.* costs, making £54 14*s.* in all. Twenty-eight cases of adulteration were taken before the magistrates and conviction obtained in 25. In two cases the vendor asked for "appeal to the cow" samples to be taken, and it was found that the cows were giving poor milk corresponding to the samples. Four surveys of dairy cattle by the veterinary inspectors have revealed 285, 264, 179, and 162 tuberculous animals, including 55, 32, 29, and 15 cases of tubercle of the udder. The cows examined numbered 52,131, 53,623, 44,648, and 42,126.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 28TH 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 232; scarlet fever, 2538; diphtheria, 1495; enteric fever, 36; pneumonia, 1019; puerperal fever, 32; puerperal pyrexia, 89; cerebro-spinal fever, 3; acute poliomyelitis, 4; acute polio-encephalitis, 1; encephalitis lethargica, 12; continued fever, 1; dysentery, 8; ophthalmia neonatorum, 76. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Dec. 31st–Jan. 1st was as follows: Small-pox, 415 under treatment, 13 under observation (last week 367 and 5 respectively); scarlet fever, 2729; diphtheria, 2743; enteric fever, 33; measles, 736; whooping cough, 135; puerperal fever, 24 (plus 12 babies); encephalitis lethargica, 118; poliomyelitis, 2; "other diseases," 15. At St. Margaret's Hospital there were 12 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns including London there was no death from small-pox, 3 (0) from enteric fever, 47 (17) from measles, 10 (5) from scarlet fever, 18 (3) from whooping-cough, 64 (9) from diphtheria, 50 (7) from diarrhœa and enteritis under two years, and 58 (8) from influenza. The figures in parentheses are those for London itself.

Wigan reported 8 deaths from measles; West Ham, Manchester, and Merthyr Tydfil, each 4. Of the 43 deaths from diarrhœa outside London 10 came from Liverpool, 5 from Salford, and 3 from Preston. Brighton records only 1 death from influenza (against 8 last week), Manchester 5, Portsmouth, Stoke-on-Trent, Liverpool and Sheffield, each 3.

The number of stillbirths notified during the week was 267 (corresponding to a rate of 61 per 1000 births), including 52 in London.

GREENOCK AUXILIARY HOSPITAL.—The new hospital which has been erected at a cost of £60,000 as an auxiliary to Greenock Royal Infirmary was opened recently by Miss Rankin who, jointly with her brother, Mr. Matthew Rankin, gave £20,000 as the nucleus of the fund for building, equipment, and endowment. There are two wards to accommodate between 20 and 30 men and women convalescents from the infirmary, and 18 private and semi-private rooms for paying patients.

DONATIONS AND BEQUESTS.—Lady Cargill, of Kelvinside, Glasgow, among other bequests, left £3000 to the Glasgow Royal Maternity and Women's Hospital, including a sum for the endowment of a bed to be called "The Mary Hope Cargill Bed," £2000 to the Royal Samaritan Hospital for Women, Glasgow, £1000 to the Royal Hospital for Sick Children, Glasgow, and £500 to the Glasgow Royal Cancer Hospital.—Mr. Arthur Sale, of Wallington, Surrey, among other bequests, left £1000 to the Derbyshire Royal Infirmary; £500 to the Royal Hospital for Incurables, Putney; £100 to the London Hospital.—Lieut.-Colonel W. B. Brocklehurst, of Butley Hall, near Macclesfield, left £1000 to the Macclesfield General Infirmary Endowment Fund.—Dr. W. R. Ashurst, of Farningham, Kent, left over £100,000 for charity, the participating institutions including the Lock Hospital, Association for Promoting the General Welfare of the Blind; Free Home for the Dying, Clapham Common, British Hospital and Home for Incurables, Streatham, Middlesex Hospital, Charing Cross Hospital, and St. Mary's Hospital.

Correspondence.

"Audi alteram partem."

BAD RADIOGRAMS.

To the Editor of THE LANCET.

SIR,—Your leading article in the last issue on The Coming of Radiology is of special interest to those who have followed the recent discussions and letters on this subject.

One very vital aspect of the case, however, seems to me to have been overlooked—namely, the pre-eminent importance of an X ray film which is technically and photographically of high standard. It is a regrettable fact that many very poor general and dental radiograms are still being produced, and the natural result is that the dental surgeon, the general practitioner and the patient are not thereby encouraged to utilise radiology to its fullest extent. A poor film may be more of a hindrance than a help; it cannot be "explained" to the patient, a large and increasing number of whom insist, justifiably in my opinion, upon seeing what are, after all, photographs of themselves for which they have paid a fee. Let me, however, emulate Agag, and tread delicately over this controversial topic!

I contend that a greatly extended use of radiology would be made if a more uniform standard of excellence could be relied upon. This is no insuperable obstacle as thousands of first-class radiograms are taken daily.

I am, Sir, yours faithfully,
J. D. KIDD, M.B., D.M.R.E.Camb.

Cavendish-square, W., Jan. 6th, 1930.

THE BRUIT D'AIRAIN.

To the Editor of THE LANCET.

SIR,—I am indebted to "Anglo-Gallicus" for his kindly remarks and criticisms of the paper on the Bruit d'Airain, or Coin Sound, by Dr. Dix-Perkin and myself. From the internal evidence of his letter I would deduce that he is a Saint-Bartien, if I may be allowed to coin an Anglo-gallicism. But this is by the way.

I feel that the main point of our work has not "got across," as our American friends would say. The fact that coins are not essential for the production of the bruit d'airain is a minor point of our thesis. This fact is known, or should have been known were it not that the bruit d'airain is called the coin sound in this country. What we did try to show were the reasons why the bruit d'airain is heard in some cases and not in others. I do not propose to take up your space by restating them.

Admittedly Laennec recognised the tinkling qualities of a pneumothorax cavity, but the sound obtained by percussion over a *tonneau vide* does not constitute a bruit d'airain, which did not, as "Anglo-Gallicus" pointed out, become a definite entity until Trousseau described it. We should, perhaps, have made the point clearer.

But I feel that I must cross swords with "Anglo-Gallicus" about the translation of *airain*. It does mean bronze, but it also means brass. In most languages many words have varying shades of meaning. The French word *bronze* most commonly means bronze, but in one connexion it must be translated by brass. *Airain* means (1) brass, (2) bronze, (3) bell-metal, (4) gun-metal. In one of its figurative senses it means boldness—e.g., *avoir un front d'airain* means "not to blush at anything," or "to be brazen-faced." Again, *siècle d'airain* means bronze age. And so on. I admit that in the industrial sense brass is translated by *cuivre jaune*—e.g., *fonderie de cuivre* means brass foundry; or again by *laiton*—e.g., *usine de laiton* means brass works. An object made of brass is colloquially referred to as *cuivre jaune*, or more usually *cuivre*. But in the term bruit d'airain we are not dealing with brass in the industrial or colloquial sense. Rather, it has a figurative or poetical implication. And in French poetry or prose where a brass-like sound is referred to, it is always rendered by *airain*. To take one well-known example in English from the New Testament—(I Corinthians, xiii., 1): "Though I speak with the tongues of men and of angels, and have not charity, I am become as sounding brass, or a tinkling cymbal." This, in the French Testament, runs as follows: "Quand je parlerais les langues des hommes et des anges, si je n'ai pas la charité, je suis un airain qui résonne, ou une cymbale qui retentit." One could give many other examples of this use of *airain*. In English we talk of a "brassy" sound, never of a "bronzy" sound.

Perhaps the confusion between the terms brass and bronze in various languages (in Spanish, for instance, *bronce* means both brass and bronze), lies in the fact that they both refer to alloys of copper, and the distinction between them is not popularly known.

I am, Sir, yours faithfully,
A. I. GRANVILLE MCLAUGHLIN.

St. Thomas's Hospital, S.E., Jan. 4th, 1930.

INFECTION AS A CAUSE OF DIABETES MELLITUS.

To the Editor of THE LANCET.

SIR,—Your annotation on the subject of the ætiology of diabetes mellitus in the issue of Jan. 4th prompts me to relate the following case. I was called to see a child, aged 4, with typical diabetes with a history of wasting, thirst, and polyuria of three months, and of drowsiness for 24 hours, and with urine loaded with sugar and showing a markedly positive ferric chloride test. The weight was 30 lb. 5 oz. Insulin treatment was instituted and during the following 16 days the dosage was increased from 6 units twice a day to 25 units in the morning and 20 units in the evening. At this stage there was a trace of sugar in the urine, the ferric chloride test was negative, and the weight had increased by 3 lb. 7 oz. On the sixteenth day a round worm six inches long was passed, and from this stage until the twenty-eighth day the amount of sugar showed a steady diminution, and the amount of insulin was correspondingly reduced, until at the end of the period the urine was sugar free with no insulin, and the weight had increased by a further 1 lb. 9 oz. At no time was the food reduced, the patient being on a full diet. Subsequently it was necessary to recommence insulin (6 units twice a day), with which treatment the child has remained well, and has continued putting on weight for three months.

The marked recovery which followed the passage of the round worm seems to suggest that the worm had some bearing in the causation of the diabetes, and I should be glad to know your views or those of any of your readers on the subject.

I am, Sir, yours faithfully,
A. T. L. KINGDON, M.R.C.S., L.R.C.P.

Leominster, Jan. 5th, 1930.

PROGRESS IN UROLOGY.

To the Editor of THE LANCET.

SIR,—In his Campbell oration, published in THE LANCET of Dec. 28th, 1929, Prof. A. Fullerton states that radium in the form of emanation seeds applied through the cystoscope is one of the most important and successful methods at our disposal for dealing with tumours of the bladder. I have recently stressed in your columns (1929, ii., 146) the reasons why this is one of the most unscientific methods. Three weeks ago I had to perform suprapubic cystotomy on a woman in order to remove calculi, the nuclei of which were emanation seeds, and also to dissect out a slough of the bladder wall, which contained more seeds. In this patient there still remains the danger of the formation of a vesico-vaginal fistula, owing to destruction of tissue from radium overdosage. The original lesion was stated to be a growth of the base of the bladder, the nature of which I maintain could not be accurately determined without microscopic examination, nor its extent without digital palpation.

I am, Sir, yours faithfully,
A. CLIFFORD MORSON.

Brook-street, Grosvenor-square, W., Jan. 4th, 1930.

IRRADIATED DEXTROCID IN THE TREATMENT OF MALIGNANT TUMOURS.

To the Editor of THE LANCET.

SIR,—I notice in THE LANCET of Jan. 4th a very interesting article on the Treatment of Malignant Tumours with Radium Catgut by Prof. Eugen Joseph, of the University of Berlin. In this article he mentions a compound of iodine and cerium called "Introcid." It may not be commonly known in this country that Prof. Friedrich Voltz, the famous radiologist, working with Geheimrat Prof. Döderlein at the Universitäts-Frauenklinik, Munich, is using in every case a similar preparation called "Dextrocid," containing dextrose, cerium, and iodine. This is obtainable from Hans Portratz, Hamburg, 39, Mülenkamp, 63, in 10 c.cm. ampoules. It is injected into the veins at the bend of the elbow immediately before irradiation by rontgenotherapy with a current of 200 K.V., and 2·5 to 3 M.A., with appropriate thick filter of copper, suitable distance of tube, given skin erythema dosage, and given field. The theory of this injection is that the cancer is sugar hungry, and attracts the dextrose which carries with it the heavy metal cerium and the iodine, and when subjected to deep therapy the molecules and atoms are split up favourably and sensitise the tumour to the X rays. This idea is reminiscent of that put forward by Dr. Monckton Copeman, who advises surface applications and injections in ulcerating growths, of sodium fluorescin, or better, strontium fluorescin, the latter being preferable on account of heavy atomic weight. Cerium is still heavier than strontium. But I have never heard that any of these preparations of cerium or metallic combinations of fluorescin have any effect whatsoever by themselves unless immediately subjected to X rays.

"Radium Catgut," as advised by Dr. Joseph, would appear to be dangerous to surgeon and patient alike, but further experience should prove or disprove its value.—I am, Sir, yours faithfully,

SPENCER MORT, M.D., M.S., F.R.C.S.,
Surgical Director, in Charge of Radium Department,
North Middlesex Hospital, London, N.

Jan. 5th, 1930.

⁂ Early in 1928 we received samples both of "Introcid" and "Dextrocid" from the firm mentioned by Mr. Mort, which apparently deals with both preparations (see THE LANCET, 1928, i., 270).—ED. L.

EMPHYSEMA TREATED BY MECHANO-THERAPY.

To the Editor of THE LANCET.

SIR,—I was much interested in Dr. Harry Campbell's remarks on mechanotherapy in emphysema in THE LANCET of Jan. 4th. In the clinical note which he criticises I could not give full information regarding the raison d'être of the treatment employed. During the first days that I was looking after the patient concerned his condition was too distressed to permit of accurate chest measurements being taken, but the circumference, as soon as it could be ascertained, was 2¼ inches greater than at the close of the treatment; at this time, in addition, the apices were seen to be much less bulging. Dr. Campbell appears to take no account of the improved diaphragmatic movement, which tends to lessen the tense condition of the thorax and give greater facilities for oxygenation. From the clinical point of view I cannot agree that the position of forced inspiration is very good for the patient (although it may be the best state that Nature unaided can bring about). The seriousness of the condition is (as we all know) due to loss of elasticity in the lungs and chest; the treatment I advocate restores this want in greater or lesser degree and this cannot be otherwise than advantageous to the patient. Local manual compression of the chest, especially during an attack of coughing, is most grateful to the patient provided that it is applied elastically and not as a dead weight. The chest wall will not merely have its shape altered, but will also become actually smaller if the rigid costo-chondral joints are rendered mobile, the intercostal muscles more active, and expiration more complete (I have never pretended to restore the quite youthful thorax). Attempts to treat emphysema on the lines given by me have been successfully made since 1865, and more particularly since 1873, when Prof. Gerhardt of Berlin made his first communication on the subject. I have never heard of any bad results where similar methods have been employed, provided that the technique was correct, and I think that there is no danger whatever of "fatal asphyxia" on which Dr. Campbell lays such stress. Perhaps he has not realised that the chest mobilisation as employed by me is a gradual process, each series of compressions lasting about 2–6 seconds, and not a sudden violent one. I am surprised that Dr. Campbell has not found that emphysematous chests become smaller after the patients have performed the expiratory exercises advocated by him over 30 years ago in a book entitled "Respiratory Exercises."

I am, Sir, yours faithfully,
A. KELLGREN-CYRIAX.
Welbeck-street, W., Jan. 5th, 1930.

THE DUMPING GROUND OF NEURASTHENIA.

To the Editor of THE LANCET.

SIR,—May I be allowed to express my appreciation of the Purvis Oration by Sir E. Farquhar Buzzard, published in your issue of Jan. 4th. I have kept records of 307 out-patient psychiatric cases seen at the Western Infirmary, Glasgow, between 1923 and 1926. Of these, 28·5 per cent. were cases in which depression was a leading symptom, without signs of gross organic disease. This figure was made up of: psychoneuroses 13·8 per cent., and manic-depressive psychoses 14·7 per cent.—thus approximating closely to Sir Farquhar Buzzard's figure of a "fifty-fifty proportion" between these two conditions. Now, to the medical man without a psychiatric training, practically all these cases were just examples of "depression" or "neurasthenia," with the term "mental case" as an occasional alternative diagnosis. The point, so very properly stressed in the Purvis Oration, is that these two groups demand an absolutely different mode of treatment; and if the treatment appropriate to a manic-depressive depression is applied to a neurasthenic, or vice versa, the result at best is unsatisfactory, and at worst is disastrous. True neurasthenia is as clean-cut a clinical picture as one is likely to see in psychiatry. That the term has become a dumping ground is the fault not of the general practitioner, but of a system of medical education which expected that the whole of psychiatry—i.e., human nature in its most complex and inaccessible phase—could be taught in ten lectures and ten demonstrations, usually of chronic psychotic patients, to the exclusion of psychoneuroses and early psychoses. Thankfully we observe, with the belated advent of psychiatric clinics in this country, the commencement of a better psychiatric education for medical students. One hopes that the day is not far distant when attendance of students at "psychiatric out-patients" will be compulsory, on the grounds that it is there that the student will see the type of case he will have to deal with in practice—even as this has long been recognised so far as ordinary medical and surgical cases are concerned.

One other aspect of Sir Farquhar Buzzard's oration calls for special appreciation. It is that he attracts attention once more to the importance of clinical psychiatry. One hears so frequently in these days that clinical psychiatry is dead, that we can learn nothing more from it, and that the biochemist is the man who is going to solve all our problems of human nature. Mercifully we have given up the hopeless task of chasing "ideas" from one brain cell to another. Can it be that the ultra-biochemists are, in the words of their equally one-sided opponents, the ultra-psychologists, taking a "flight from reality," from an "intolerable situation," into a "world of phantasy," so rich in hydrogen-ion concentrations, sedimentation velocities, and phospho-proteins, that they forget that the main problem is that of an individual trying to grapple with and adapt himself to his environment, and that the object of psychiatry is to find out why he is not doing it successfully?

Consider what clinical psychiatry was in Clouston's day: a careful, detailed, individualistic record of the patient's life and the stresses which were brought to bear on it; a method of approach which, amplified and extended since first Clouston outlined it, now reaches its mature form in the teachings of Adolf Meyer with his "doctrine of integration" and his "psycho-biological view-point." This doctrine does away once and for all with the old dualistic controversy of body and mind as a necessary part of psychiatric philosophy; and it recognises no incompatibility between functional and organic psychoses, or diseases. It deals only with facts, avoiding the phantastic hypotheses of the extreme biochemists and extreme psychologists, so that by its use we may hope to acquire "a due sense of proportion, and a lively sense of the ridiculous."

I am, Sir, yours faithfully,
IAN SKOTTOWE,
Deputy Medical Superintendent, Cardiff City Mental Hospital.
Jan. 6th, 1930.

MUTILATING OPERATIONS.

To the Editor of THE LANCET.

SIR,—My friend Mr. Hanschell thinks that "some rather obvious data have been overlooked" by me. But I assure him that I have long been familiar with all those so clearly set out by him, and that none seems to me inconsistent with what I wrote. Indeed, I thought my recognition of them was implicit in my phrases. But I am grateful for the opportunity of being explicit, in terms of individual psychology, and of clearing myself from the reproach of being "baffling," even if I acquire that of being banal.

It is of the very essence of individual psychology that "circumstances alter cases," and that, in Adler's words, not only the trauma or the organ-inferiority is of importance, but the courage with which either is met. There may be all the difference in the world between ritual circumcision, done under appropriate conditions, and the boggling "snips," clumsily carried out by house surgeons and others which do, in so many cases, actually "strip the penis," and set up, according to the standards of the unmutilated, a truly villainous deformity. So, in writing that "one is compelled to consider the effect, in provoking racial neurosis, of racial and ritual circumcision" I did not suggest that ritual circumcision *always* provokes racial neurosis—far less that it always does so in the restricted sense in which Mr. Hanschell seems to use the term. I was referring to the desirability of studying the conditions under which it may, or does, produce racial neurosis.

The fact is that such a trauma as a sexual mutilation, and such an organ-inferiority as the state of being without a prepuce may, like any other trauma or inferiority, be met by the individual in any one of several ways. There is, firstly, the strong, or Demosthenes reaction: the effort to overcome that results in a greater development of local function. This is well enough; but sometimes the general, psychical, compensatory process is carried to lengths that are positively anti-social, and in that sense, neurotic. Cruelty may beget cruelty, and the bloodthirsty and sadistic traits of some of the peoples mentioned by Mr. Hanschell are, in this view, psychical over-compensations for the original bloody experience and the consequent deformity. Such psychical over-compensations may be said to have physical analogues in the keloid scars which, as a matter of fact, are so often consequent upon wounds such as those of ritual mutilations, whose infliction has been attended by certain psychological reactions. In the great days of Judah, the predicament of being without a foreskin, whilst a subject of boasting in the presence of the despised Philistines, was, often enough, definitely linked with psychical over-compensations ending in rapings, slaughters and the like. Now the case is altered. The mutilation of which a Maccabæan warrior was proud in moments of victory and bloodshed does not appear in quite the same light to an intelligent, but timid little Jewish boy in an English public school. *His* reaction is of Adler's second type, out of which grow the neuroses and psychoneuroses when his gentile school-fellows compensate for *their* intellectual inferiority by teasing *him* about what they (and he) deem *his* penile inferiority. There is so much difference between being a top-dog and the bottom one! Now, with the utmost admiration for a people among whom I am proud to have many friends, I do ask to what extent the present proclivity of the Jews to general, and not merely sexual, neurosis may not be connected with submission to an organ-mutilation, whilst in a socially inferior position numerically. Of course, the levels at which sexual trauma and sexual organ-inferiority are operative, in the production of neurosis, are subconscious and unconscious as well as conscious ones, and the psychological effects of a sexual trauma or sexual organ-inferiority, which *discourages* the individual, or isolates him to his own disadvantage, spread far beyond the limits of an obviously "sexual" neurosis.

But when ritual circumcision is made the prelude to the assumption of manly rights, the lad, Masai or other, will set his teeth and go through the ordeal pluckily, just as the young rider to hounds, unless he be a coward, will anticipate the blooding he is to undergo when in at his first death. The mutilation is one opening the gates of privilege. But circumcision, as practised in this country by many doctors, under the pretext that it is a safeguard against masturbation, is, in effect, very often a sort of psychological castration, a mutilation that *discourages* the individual, isolating him to his own disadvantage. I appreciate immensely Mr. Geoffrey Keynes's important concurrence.

For centuries untold, I do not doubt, African girls have submitted to *ganza* (the pre-marital rite discussed by the Duchess of Atholl) with courage, nay, even with pride at their initiation into womanhood. But the bride who chooses pre-marital defloration, with scissors "curved on the flat," instead of submission to the bridegroom's "love which thrives on obstacles," is shirking an experience which, if met with courage, is of real value to the individual. The "operation" itself is clearly a concession—and often a willing one—by the "operator" to the demand, already neurotic, for an escape from an occasion for courageous personal effort. Our business, as physicians, seems to be to so guide or arrange that injury and inferiority should be as a stimulus to local and general development without anti-social over-compensation on the one hand, or weakening of independence on the other, and never an excuse for the growth of local and general inferiority-sense. Far less should any injury or inferiority be allowed to become the pretext for Adler's *third* form of reaction—retreat into disease, degeneration, or despair. But, on the other count, we must remember that when social feeling is weakened by the suppression of ritual customs or otherwise, interest in community-life flags, and the race dies out. It is this weakening of the community interest that is so much to be avoided—the Jews, a dispersed people, do so by affirming the family life—and yet the very ritual that serves as a social ligature in one place may entail social disadvantage elsewhere.

Equally, we must hesitate lest, while suppressing tribal customs that may be useful in Africa—just because they are repugnant to our prejudices—we nevertheless open the door, under the pretext of Science, to the practice of similar mutilations under conditions that make for neurosis—just because they satisfy certain demands of the *operator*. I do not think there is any substantial difference between Mr. Hanschell and myself, either in the matter of data, or of opinion. At least, I hope not. But we are what we are by reason of our experiences and our reactions to them. And I am afraid I must charge the blood-shedding and mutilating tendencies of some of the peoples mentioned by him, at any rate in part to the bloody mutilations performed on them, no less confidently than I regard the general neurosis of many weakly men as in great part due to the "unprovoked and unwarrantable trauma" that they have sustained at the hands of doctors.

I am, Sir, yours faithfully,

F. G. CROOKSHANK.

Wimpole-street, W., Jan. 4th, 1930.

TREATMENT OF PERFORATED PEPTIC ULCER.

To the Editor of THE LANCET.

SIR,—The interesting article on Perforated Peptic Ulcer by Mr. Herbert Williams and Mr. C. H. Walsh in THE LANCET of Jan. 4th invites some criticism on account of the rather elaborate technique advocated and the lack of any evidence of a corresponding improvement in the results of the operation. I refer particularly to the perforated duodenal ulcer. Surely the operation for the closure of a perforated duodenal ulcer is usually the simplest task in the whole field of acute abdominal surgery. In the operative treatment of no other acute lesion is Nature so kind and forgiving to the surgeon, and to ignore this, as the authors appear to me to do, is to make the operation unnecessarily severe. The method I have come to adopt for many years past is to close the perforation with a single mattress suture of linen thread, care being taken to pass the needle through the duodenal wall at a judicious distance from the edges of the perforation, and to use a double cast in the first part of the knot so as to prevent any slipping of the suture during completion of the knot. After tying the knot the ends of the suture are left long and a convenient tag of omentum (or even a flap from the falciform ligament) is drawn over the site of the perforation and fixed in position by tying the ends of the suture over it. Rarely is it necessary to do more than this, but if the previous history of the patient, or the appearance of the parts at operation, indicates the existence of manifest pyloric stenosis with gastric dilatation, then (and only then) a gastro-jejunostomy is performed. If the patient's condition is so poor that gastro-jejunostomy would entail a serious addition to the risk, then a high jejunostomy is performed (inserting a No. 10 rubber catheter by the Witzel method) and the stomach is emptied by the passage of a stomach tube before the abdomen is closed. The patient is nourished entirely through the jejunal tube for at least a week, and generally much longer. So far as the treatment of the peritoneal cavity is concerned, as soon as the abdomen has been opened and the diagnosis verified an abdominal swab is placed in the right subphrenic area, another in the right kidney pouch, and one or two in the pelvis; after the closure of the perforation and the wiping of the immediate area these swabs are removed and little, if any, further wiping out of the peritoneum is necessary. Finally, no drainage of the peritoneal cavity is carried out though the parietal wound is usually drained with a wisp of rubber tissue.

In 33 consecutive cases of duodenal perforation treated by me on these lines during the past five years (29 operations at the Manchester Royal Infirmary and 4 at the York Place Nursing Home) there were but two deaths, and neither of these could possibly be attributed to faulty closure of the perforation. One death was due to pulmonary embolism on the 14th day after the patient had been allowed to get up, and the other to acute bronchitis on the 12th day in a man aged 61—the occurrence of bronchitis was amply explained by a total failure, in early February and about nine days after his operation, of the heating arrangements of the large ward in which he was confined. In only one of the 33 was peritoneal drainage instituted, and the only secondary operation required was that of gastro-enterostomy in two cases. The gastric ulcer perforation is treated on similar lines, but here a high jejunostomy, as just described, is regarded as a valuable measure in most cases, in fact as essential in large perforations. In a series of seven such cases there was one death due to reperforation three weeks after operation—probably excited by the fact that the patient was allowed to get up too soon considering the massive size of the perforation at the original operation.

If, then, a mortality-rate of 6 to 7 per cent. in the perforated duodenal ulcer, and one of less than 20 per cent. in the perforated gastric ulcer, can be obtained by such simple methods, one may venture to call in question more elaborate methods, requiring in some instances a specially designed instrument, which produce inferior results.

In closing may I make a plea for the value of the institution of medical treatment of duodenal ulcer as soon as the patient has recovered from the immediate effects of his perforation and operation? The time and occasion are certainly apt, and it is reasonable to believe that the ulcer is particularly susceptible to treatment in this period.

I am, Sir, yours faithfully,

Manchester, Jan. 6th, 1930. H. H. RAYNER.

PSITTACOSIS.

To the Editor of THE LANCET.

SIR,—I note on p. 1320 of THE LANCET, Dec. 21st, 1929, in the annotation on "psittacosis," mention is made of the probability that infection of man from avian sources is exceedingly uncommon, and that the occurrence of this disease amongst birds at the London Zoo is unknown. Whilst in agreement with the former statement I might point out that in 1920, in an investigation of an epidemic amongst birds at the Zoo, the so-called organism *B. psittacosis* was shown by me to be responsible for the infection. Opportunity was also taken in connexion with this investigation to confirm the identity of this organism with the commonest type of *B. aertrycke* associated with human cases of food poisoning. These observations were published in the *British Journal of Experimental Pathology*, Vol. I., No. 3, June, 1920.

I am, Sir, yours faithfully,

H. MARRIAN PERRY.

Public Health Laboratories, Cairo, Dec. 30th, 1929.

TREATMENT OF DRUG ADDICTS IN NEW YORK CITY.

To the Editor of THE LANCET.

SIR,—I was interested in the report of the New York Committee investigating methods of treatment for drug addiction, and in Dr. Stanford Park's comments on it in your last issue. With regard to treatment with narcosan, I can confirm its utter worthlessness from my own experience. Some time ago I treated a case of morphia addiction, stopping all morphia immediately, and giving injections of narcosan every four hours. Up to the time of the first injection there were no symptoms; soon after, intense restlessness set in. After the second injection there was retching and vomiting, while the restlessness had become almost delirium. A third injection producing no improvement, and the condition of the patient rapidly becoming worse, the treatment was abandoned. Incidentally the injections caused considerable local pain and induration which persisted for some days.

I agree with Dr. Park that, in the case of morphia addiction at any rate, gradual withdrawal is the only method of treatment that is either tolerable or tolerated. In the treatment of symptoms that arise I think strychnine, in the form of tinct. nucis. vom., regularly administered, is very valuable, and it does shorten the period required for complete cure.

I am, Sir, yours faithfully,

Edgware, Jan. 5th, 1930. A. G. WESTON, M.D.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Lts. W. Flynn and W. G. O. Fitzpatrick to be Surg. Lt.-Comdrs. Surg. Lt.-Comdr. B. S. Collings is placed on the retd. list.

The following appointments are notified:—Surg.-Comdrs.: V. H. Vey to *Cumberland;* H. Wilks to *Pembroke,* for R.N. Barracks; R. P. Ninnis to *Tiger;* H. M. Whelan to *President;* G. R. McCowen to *Barham;* and G. G. Vickery to *Warspite.* Surg.-Lts.: E. J. K. Weeks to *Centurion;* and R. G. Anthony to *Victory* for R.N. Barracks, Portsmouth; J. Johnston to *Dolphin;* T. S. Osborne to *Victory* for R.N. Barracks; and C. H. Birt to *Glorious.* Surg.-Lts. (D.): H. V. Pell to *Resolution;* and D. L. Simpson to *Assistance.*

ROYAL ARMY MEDICAL CORPS.

TERRITORIAL ARMY.

Lt.-Col. (Bt. Col.) F. G. Lescher from Gen. List, R.A.M.C., to be Col. and to be A.D.M.S., 46th (N. Midland) Div., vice Col. E. A. Wraith.

Capt. A. R. Laurie to be Lt.-Col. and to comd. the 137th (N. Midland) Fd. Amb.

Capts. (Bt. Maj.) G. J. Linklater and A. G. Williams to be Majs.

Lt. D. Lamont to be Capt.

Lt. G. Lyon-Smith (late R.F.A., T.F.), to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt.-Cols. W. T. Rowe and G. T. Willan, having attained the age limit, retire and retain their rank, with permission to wear the prescribed uniform.

Capt. A. S. Reeves, having attained the age limit, relinquishes his commn. and retains his rank.

ROYAL AIR FORCE.

Flying Officer T. A. Edwards resigns his short service commisson.

Flight Lt. A. W. Comber relinquishes his temporary commission on completion of service.

INDIAN MEDICAL SERVICE.

Capt. S. N. Hayes to be Maj.

Lt.-Col. C. E. Southon retires.

The undermentioned officers have vacated appts. in India:—D.M.S.: Maj.-Gen. Sir W. H. Ogilvie, I.M.S. D.D.M.S.: Col. W. R. Blackwell. A.D.M.S. (Pers.): Lt.-Col. A. A. C. McNeill, I.M.S. D.A.D.M.S.: Maj. (Bt. Lt.-Col.) E. T. Potts, R.A.M.C.

The undermentioned appointments have been made in India:—D.D.M.S. and D. (Hosp. Orgn.): Lt.-Col. (Bt. Col.) E. A. Walker, I.M.S. A.D.M.S. (Pers.): Maj. (Bt. Lt.-Col.) E. T. Potts, R.A.M.C. D.A.D.M.S.: Maj. H. H. Brown, I.M.S. Dir. Med. Orgn. for War: Lt.-Col. A. A. C. McNeill, I.M.S.

ORDER OF THE HOSPITAL OF ST. JOHN OF JERUSALEM.—The following appointments in the Venerable Order have been sanctioned by the King: *Commanders:* Dr. C. Bage, Lieut.-Colonel H. R. G. Poate, Dr. L. W. Dryland, Dr. N. C. Fletcher, and Dr. G. P. Mosscrop. *Officers:* Mr. H. L. Brownlow, Dr. F. Hichens, Major R. D. O. Cran, Lieut.-Colonel A. R. Falconer, Sir Louis E. Barnett, Dr. J. B. Gunson, Dr. G. H. Hogg, Dr. J. H. G. Robertson, Dr. A. N. McKelvey, Lieut.-Colonel H. Spackman, Colonel A. V. Clarke, Dr. Daisy E. Platts-Mills, and Dr. Elizabeth G. Stuart. *Serving Brothers:* Dr. A. P. Gibbons, Dr. A. B. Cardew, Dr. C. Hibbert, Dr. J. Murray, Dr. J. W. Wyncoll, and Dr. J. L. Callaghan.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—The annual Yeomanry Dinner of this Society was held at the Apothecaries Hall on Tuesday, Jan. 7th, when the Master, Lieut.-Colonel. C. T. Samman, presided over a large company which included thirteen Masters or Past Masters of City Companies, with the Minister of Health, Mr. Arthur Greenwood, as the principal guest. After the loyal toasts, the Master proposed the health of His Majesty's Ministers in a short speech in which he claimed, and gave evidence for his claim, a place in the national progress for the Apothecaries. Over 250 years ago, he said, they were acknowledged to have rendered splendid service to the population of London during the devastating plague, and now, within the last few weeks, the Society had provided the machinery, through an honours diploma, for improving the obstetric service of the country. In associating the name of Mr. Greenwood with the toast he paid a high tribute to the work of the Ministry of Health during its ten years of life.

Mr. Greenwood, in response, disclaimed any intention of providing statistical information, but pointed to certain significant figures, proving great progress in general and domestic hygiene, a circumstance which, he said, must not blind them to the fact that the nation still has a lamentable mass of disability to deal with. He pointed out that public health was a world problem, which could only be solved by the coöperative work of the medical profession in all countries; and not only of the members of the medical profession, but of members of the public, plain ordinary folk like himself, who wished to understand the proper way of living in order to promote the general welfare. He professed his profound belief in the fundamental soundness of our people, obscured though it was in many directions by social evils; our people, he added, were leading the world still in the devising and carrying out of public health measures, while they had been the predominant force in the health section of the League of Nations.

Sir George Buchanan, the senior warden of the Society, in proposing the health of the guests, pointed out to the high officers in City Companies, who were present, the peculiar position which the Society occupied as the exponent of "a mystery," and he suggested that King James I. from whom their Charter was derived, had been responsible for the phrasing of his document. Mr. Justice Humphreys, Sir Andrew Balfour, and Sir Humphry Rolleston responded.

HUNTERIAN SOCIETY.—The banquet to commemorate the 202nd anniversary of the birth of John Hunter will be held at the May Fair Hotel, Berkeley-street, London, W. 1, on Thursday, Feb. 13th.

GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION.—A new cycle of inspection of final examinations in medicine, surgery, and midwifery is about to commence, and under Section 3 (2) of the Medical Act, 1886, the following inspectors have been appointed: In medicine, Dr. T. Wardrop Griffith; in surgery, Dr. Farquhar Macrae; and in midwifery, Dr. J. S. Fairbairn.

BRITISH SOCIAL HYGIENE COUNCIL.—A course of 10 free lectures will be given under the auspices of the British Social Hygiene Council at the Central Hall, Westminster, London, S.W., on Thursdays beginning on Jan. 23rd at 5.30 P.M. and ending on March 27th. The general title of the lectures "Some Practical Aspects of Social Hygiene with Special Application to Problems of Youth" indicates their scope. On Jan. 23rd and 30th Mr. C. C. Hentschel will discuss the training of youth and the influences of heredity and environment upon individual development. On Feb. 6th Dr. I. Feldman will lecture on continence in its physiological bearings, and on Feb. 13th on general problems of adolescence. On Feb. 20th Dr. Marjorie Smith Wilson will deal with the medical aspects of social hygiene; and on Feb. 27th and March 6th respectively Prof. Cyril Burt will lecture on the psychology of the child and the adult. On March 13th Dr. Sloan Chesser will lecture on social ideals as expressed in the home and domestic health; and on March 20th Mrs. Neville Rolfe will discuss social hygiene from the community point of view. On March 27th there will be a general discussion under the chairmanship of Prof. Winifred Cullis, head of the Department of Physiology at the London School of Medicine for Women, in which all are invited to participate.

These lectures were recently announced for delivery at the Livingstone Hall, but the great number of applications for tickets necessitated the holding of the meetings at the Central Hall, Westminster, with its greater accommodation

NATIONAL BIRTHDAY TRUST FUND.—This Fund, which has for its object the extension of maternity services, recently held its annual meeting. It was reported that only 720 beds are available for its purposes in the voluntary hospitals, and that Lord Melchett's statement in a recent speech that there are 2000 beds empty in hospitals referred to poor-law infirmaries. Owners of famous houses are being asked to give tea-parties to view them for the benefit of the Fund.

ROYAL PORTSMOUTH HOSPITAL.—An anonymous benefactor, who is now stated to be Sir Woolmer White, a former chairman of the Governors, recently offered to give £40,000 towards enlargement and modernisation of this hospital. The condition was annexed that the city should raise an equal amount. It is now announced that the condition has been fulfilled, and that the entire sum of £80,000 is available for the remodelling of the hospital.

ROYAL SANITARY INSTITUTE.—The Henry Saxon Snell Prize was founded to encourage improvements in the construction or adaptation of sanitary appliances. It will be awarded in 1930 for an essay of not more than 5000 words on Improvements in the Sanitary Provisions of Schools. The prize will consist of 50 guineas and a medal. Further particulars may be had from the secretary of the institute, 90, Buckingham Palace-road, London, S.W. 1.

METROPOLITAN HOSPITAL SUNDAY FUND.—At the annual meeting of the Metropolitan Hospital Sunday Fund it was stated that the collection for 1929 (£85,200) again showed a small reduction—£214. The £35,400 from church collections was an increase of only £3700 over the amounts coming from those sources in 1885. In the hope of reaching people who do not go to church, 200 collecting boxes, shaped like golf balls, were distributed among clubs, but the result was an average of not more than £1 per box.

BRITISH INSTITUTE OF PHILOSOPHICAL STUDIES.—At 8.15 P.M. on Tuesday, Jan. 14th, at the Royal Society of Arts, John-street, Adelphi, London, W.C. 2, Principal L. P. Jacks will lecture on Adult Education. This lecture will be open to the public without charge. Four lectures on Science and Art will be given by Prof. S. Alexander at 5.45 P.M. on Fridays, Jan. 31st, and Feb. 7th, 14th, and 21st. At the same hour on Thursdays, Jan. 16th, 23rd, 30th, and Feb. 6th, 13th, 20th, Prof. W. G. de Burgh will give six lectures on Some Aspects of the Moral Life. Both courses of lectures will be given at the Royal Anthropological Institute, 52, Upper Bedford-place, London, W.C. Syllabuses and form of registration may be had from the Director of Studies, 88, Kingsway. W.C. 2.

THE NEW PENSIONS ACT.—The Widows', Orphans' and Old Age Contributory Pensions Act, 1929, which came into operation on Jan. 2nd, brings in two large groups of new pensioners. The first group consists of wives of men who reached the age of 70 before Jan. 2nd, 1928, and are entitled to full pensions under the Old Age Pensions Acts of 1908 to 1924, free from the conditions as to means imposed by those Acts, by virtue of their insurance. The wives of these men have hitherto had to wait until they also reached age 70 before being given old age pensions in right of their husbands' insurance. Under the new Act these women are now to be entitled to old age pensions between the ages of 65 and 70. Claims under this heading should be made on Form C.P.1, which can be got at any post-office.

The second group of new pensioners are widows of men who died (or attained age 70) before Jan. 4th, 1926. They are to receive widows' pensions at the age of 55. The essential condition for the award of these pensions is that the claimant's husband must have been of the insurable class at some time within the three years before his death or his 70th birthday. The precise terms of this and other conditions are set out in an explanatory leaflet (W.P.5) which can be had on application at any post-office. For qualified widows who will have reached the age of 60 before Jan. 1st, 1931, the new pensions are to begin from July 2nd, 1930, or the date of attaining age 60, whichever is the later; in all other cases the pension will begin from Jan. 1st, 1931, or the date of attaining age 55, whichever is the later.

The leaflet now available at post-offices explaining the new pensions also gives full particulars of the changes made by the Act in existing conditions. Provision is made enabling persons who go to any part of the Empire to continue receiving their pensions or to maintain their insurance for pensions purposes. The right to become voluntary contributors for all health insurance and pensions benefits is now given to persons in excepted employments who are compulsorily insured for some or all pensions. A memorandum dealing with voluntary insurance may be had from the Ministry of Health, Whitehall, S.W. 1.

medical or surgical treatment. There he can be sure of the highest skill available, and of everything in the way of equipment that modern knowledge and ingenuity have devised. Once he is safely in bed in a ward in any one of our voluntary hospitals, docker or dustman can count on receiving treatment at least equal to that which prince or millionaire can command. The results being what they are it is truly astonishing that the electors have for so long allowed their political representatives to trifle with the question of adequate hospital provision. It is stated that there is, at this moment, a waiting list of 5000 seeking admission to the Royal Edinburgh Infirmary alone.

Club Practice.

Since the middle of the last century, when parish doctors were appointed in every district to provide domiciliary treatment under the poor-law for those unable to make any medical provision for themselves, there has been a steadily increasing recognition of the desirability—on public, philanthropic, and prudential grounds—of arranging for some sort of medical supervision and treatment in times of stress. Parish doctoring was, for the most part, not such as to lead those not so compelled to trust themselves to its ministrations. Throughout the country a system of voluntary clubs grew up, the members of which, by paying a few pence a week, were guaranteed, in addition to sundry money payments during illness or old age, the services of a doctor when necessary. These club doctors received but a small annual payment in respect of each member—generally about four shillings, out of which drugs had to be provided—and, although many gave a service fully up to the standard represented by contemporary medical knowledge, the system put too great a strain on professional and technical honour. Club doctoring came to be looked upon as but one shade better than parish doctoring, and accordingly the political ground at the end of the first decade of this century seemed ready for some big national scheme of domiciliary treatment—a readiness which Mr. Lloyd George and other astute, public-spirited or philanthropic politicians sought to exploit.

National Health Insurance.

Thus it was that, in 1912, the Health Insurance Act came into operation and every wage-earner in the country was provided with a panel doctor of his own. Unfortunately, the methods of politics, rather than those of science or of statesmanship, were the ones employed in bringing about this medical revolution. In practice politics all too often involve the squaring of vested interests. Mr. Lloyd George was faced by powerful corporations whose goodwill, or at least compliance, was essential to the enactment and carrying out of his proposals. The big Friendly Societies and the industrial Insurance Companies were quieted by being given the control and administration of the various cash benefits to be provided. The doctors, seeing the danger which confronted that independence of judgment and that personal relation between them and their patients on which the best practice has always been based, were up in arms. But they also proved susceptible to financial promises. Consequently, in the discussions and the bargainings between the Government and the medical profession, it was rate of payment rather than efficiency of service that always stood first on the agenda.

The Defects of the Panel System.

The one piece of medical organisation that emerged is what we are now familiar with as the panel system; the working of which has at least been an interesting experiment in democratic methods. Considered in the large, the panel service represents a great advance on any collectively provided medical service that preceded it. Moreover, anyone familiar with the conditions of private medical practice among the city poor at the beginning of the present century can but recognise the immensity of the improvement that has taken place. The doctor—so far as insured persons are concerned—is spared the humiliating experience of taking from an ill-nourished family a fee which represents to-morrow's dinner; nor need he apologise for visiting his pneumonia patient as often as he thinks it desirable. Personally, I have always felt that it would be a good thing were the private and individual acceptance of medical fees made a penal offence, like the acceptance of secret commissions: but perhaps I am a little biased in this matter. Still, I think that plenty of other doctors with similar experience of industrial practice in pre-insurance days will feel much as I do.

It was, I believe, the original intention of Mr. Lloyd George and his advisers to establish throughout the country a salaried service of district insurance doctors, and many people regret that the original intention was not carried out. Many arguments may be advanced on either side, the force of which varies with the point of view. It is, of course, desirable, in the interests of national health, that conscientious doctors shall be free to act according to their own judgment, regardless of the whimsies, prejudices, and misconceptions of ill-informed patients. Under the panel system, which makes the doctor's income depend mainly on his popularity, a certain measure of scientific independence is inevitably sacrificed. But, if we regard the prime function of the panel service as the providing of a "benefit" for the individual patient—the sort of service he would normally provide for himself if he had the money—then, in the present state of popular education, it is far better for the insured person to be in a position to express his dissatisfaction by "changing his doctor" just as a private patient can and does, than to have no remedy except that of making a formal complaint to some committee or administrative officer. Though good and conscientious doctors do their best work when least interfered with, such men do good work under any scheme. The panel system has materially raised the standard of medical treatment in poor areas, and it has drawn to those districts hundreds of fairly competent young practitioners who, in the old days, would never have thought of facing the discomforts involved for the small fees then obtainable. But, in the course of raising the general standard of industrial medical treatment, it has tended to discourage originality and to formalise the relation between doctor and patient. These evils are, however, not essential accompaniments of the system. Their existence may, in fact, be more accurately attributed to the self-assertiveness and spiritual pettiness of a bureaucracy—lay and medical—that is more and more firmly establishing itself. Unless this is changed we may increasingly expect to find that men of character and independence will avoid the panel service, which will attract mainly those susceptible to the bait of a fairly good assured income for uninspired routine work.

A vicious circle has been established. Suavity appeals to the average patient no less than skill; a mere formal observance of the regulations satisfies the authorities and paymasters; outstanding excellence wins neither praise nor reward in either quarter. Originality and devotion, as things are at present, are as likely as neglect or incapacity to bring the practitioner before some or other tribunal entitled to demand an explanation of his eccentricity.

The Remedy.

But these extraneous defects could readily be removed if the great body of medical practitioners were as concerned with technical efficiency and professional honour as with the Insurance Committee's quarterly cheques. And the same is true of those limitations, artificial and illogical to a degree, which go far to sterilise medical work under the Health Insurance Act. What can be said of a national system which, whilst providing some kind of medical service for those employed members of a family who are over the age of 16 years, leaves the rest of the household to get along the best way they can; which puts "out of benefit" a married woman who devotes herself to her home and children; and which furnishes only such medical treatment as even poor people can most easily obtain for themselves—viz., such as can be given by "a general practitioner of average competence and skill?" In actual practice this "treatment" works out at the annual prescribing and provision of millions of gallons of "medicine," probably not more than one-tenth of which has the slightest therapeutic significance. "He is the best doctor who knows the worthlessness of the most drugs." Treatment is more and more demanding specialist knowledge and elaborate equipment, and these should be available promptly and conveniently to all those who really need them.

The enormous fall in the death-rate that has characterised the last half century is due hardly at all to strictly "medical treatment" in the old sense of the term. Mainly the credit belongs to our effective sanitary service, to aseptic surgery, to sounder hygienic notions, and to an improvement in the general standard of living. In spite of its enormous possibilities, it is difficult to place high valuation on the part in the promotion of the national health played by the Health Insurance Act, as at present administered and medically interpreted. Either the panel system should be abolished, or the whole population—at any rate the whole working-class population—should be brought under it. Apart from the treatment of minor ailments calling for no particular specialist skill and no particular equipment, and the directing of the domiciliary treatment of such illnesses as call for little beyond nursing and symptomatic drug therapy, the panel doctor might most usefully be employed in the work of preliminary diagnosis and of hygienic education. For the first of these duties he is already moderately well trained; for the second he is hardly trained at all. If we are to produce a really effective health organisation the General Medical Council will have to examine in a revolutionary spirit the whole system of medical education in this country

The Future.

Since the establishment of the Ministry of Health something has been done in the way of coördination. But the

Ministry has far too many and too mixed duties and interests. The whole problem needs to be considered from the point of view of national requirements; free from the dominance of parsimony, local or sectional jealousies, or vested interests. Between the several units which make up the medical army there is little cohesion, little inter-relation. Nor, in spite of the unctuousness and fine sentiments which characterise so many medical utterances, is there as yet any widespread desire among practitioners to subordinate temporary and personal advantages to the well-being of the nation or to the perfecting of the service of which our guild is the privileged instrument.

PUBLIC HEALTH IN KENYA.

A GOVERNMENT report for 1928 on the Colony and Protectorate of Kenya has just been issued. Referring to public health it states that the most outstanding feature of the year with regard to the incidence of communicable disease was the occurrence of a number of severe outbreaks of malaria in certain parts of the highlands of the colony. In all six districts were affected, four being native reserves and two being European farming areas, or "settled districts." The latter had been affected to some extent by the epidemic of 1926, while the four native reserves, so far as is known, had not previously suffered from malaria in epidemic form. In 1926 the most serious incidence occurred in the central highlands, but in 1928 the latter were not seriously affected, the incidence of epidemic malaria being confined to the north-western highlands—that is, to the more or less continuous stretch which lies to the north-west of the Great Rift Valley and between the valley and the basin of the Victoria Nyanza. The position for a time was undoubtedly serious. It is a matter for some satisfaction, however, that there is now an increased appreciation of the fact that under present conditions malaria, even in non-endemic areas, may from time to time become of grave importance. No other unusual incidence of communicable disease occurred during the year, and it cannot be said that the general health of the population of the colony as a whole was less satisfactory than in previous years. In the absence of accurate vital statistics it is impossible to measure any small variations in the general standard of health which may be occurring.

But work was carried out during 1928 which at a later date will allow of more accurate estimates being made of the results of the medical, sanitary, agricultural, and social developments which are now taking place in the native reserves. This work was undertaken more particularly in connexion with the ankylostomiasis campaign which was carried out in the Digo Reserve on the coast, where large numbers of the natives who presented themselves for treatment were submitted to a full and careful physical examination and the results recorded. The findings confirm the opinion which has been expressed in many previous reports to the effect that the standard of health which prevails among African natives is generally at a low level, and that, with few exceptions, the physique and capacity of the population are affected as the result of infection with those endemic preventable diseases which generally prevail where the standard of culture of the people and the cultivation of the land is still primitive. In the reserves other than Digo the collection of information regarding the physical and pathological condition of the inhabitants has also been pursued. Of the general observations which have been made, perhaps the most outstanding have reference to the incidence of infection with intestinal worms and the effect of such infections on the population. Hitherto, among the diseases resulting from infection with intestinal worms, hookworm alone has received much attention, but during the past year evidence has been accumulating which indicates that the disability which results from infection with tapeworms and roundworms is by no means negligible, and that in countries such as Kenya, where the infections are common, the diseases which result play a much larger part in lowering the standard of the public health than has hitherto been realised. In the Teita Reserve, in Ukamba Province, a sanitation campaign was carried out, the infection with which it was hoped to deal being roundworm.

During the year the incidence of plague was not notable and was chiefly limited to a small outbreak in Nairobi and sporadic outbreaks in the endemic areas of the Nyanza Province. In the settled areas the incidence was very low. Four sporadic cases occurred in Mombasa. Throughout the year five cases of small-pox were reported, but in no case could the source of infection be traced. Of the acute fevers, pneumonia, as usual, caused much sickness, and in the towns especially, and among the poorer section of the urban native population this disease was responsible for a high mortality. In the native reserves yaws, in spite of the large number of cases which have been treated during recent years, continues to cause much disability, and it is only in the Kikuyu district of Fort Hall that there would yet appear to have been a large reduction of the incidence. The total number of cases treated in 1928 was 85,617. In certain parts of the Nyanza Province the incidence of syphilis presents a problem of some magnitude, and during the year increased efforts have been made in these areas to induce patients to attend regularly for treatment. These efforts have met with some degree of success, but the number of patients so attending is still small in proportion to the numbers who do not return after they have been relieved of their more distressing symptoms.

The work of the medical department during the year was carried out on normal lines, except that in certain native reserves particular attention was devoted to helminthic diseases and the treatment of syphilis, while in the towns particular attention was given to the control of malaria. The investigation of mosquito conditions received special attention. The general health of native labourers may be confidently said to be steadily improving. This is due in part to the progressive realisation by employers of the importance of an adequate and varied diet and of sanitary surroundings, and partly to the regular system of Government inspection and exhortation which is maintained by the principal labour inspector and his officers.

The range of temperature between different parts of Kenya is very wide. At Lamu on the coast the mean shade temperature is 80° F.; at Mombasa it is 77° F.; in Kisumu, on the Victoria Nyanza, it is 72·5° F.; and in the Rift Valley and highland areas is normally between 58° F. and 65° F. The rainfall is generally well distributed. Recipitation varies considerably with the physical configuration of the colony. The average annual rainfall, taken over a number of years, ranges from 10 inches at Athi River, on the plains some 20 miles south-east of Nairobi, to 86 inches at Songhor in the Nandi Hills east of the Victoria Nyanza. The low-lying districts on the northern frontier are dry. The heaviest rainfall is normally experienced from March to June, and October to December. Hail is of comparatively rare occurrence, and is confined to restricted belts. Frost does not occur below 8000 feet except in some damp hollows. The land area is 219,731 square miles, and the water area 5229 square miles, the latter including the larger portion of Lake Rudolf and the eastern waters of the Victoria Nyanza, including the Kavirondo Gulf. Mount Kenya, after which the colony is named, is 17,040 feet in height and is capped by perpetual snow and ice. Mount Elgon, also an extinct volcano, is 14,140 feet in height and is slightly below the level of perpetual snow. The Aberdare Range contains Settima (13,000 feet) and Mount Kinangop (12,816 feet). The Mau Escarpment attains a height of over 10,000 feet. The total population of Kenya is now estimated at 2,891,691. By a census taken in 1926 it was shown that there were then included 12,529 Europeans, 30,583 Asiatics, and 10,557 Arabs. The number of Africans, by a rough calculation, is put at 2,838,022.

CARDIAC IRREGULARITY AND THYROID TOXÆMIA.

IN a discussion of the cardiac irregularities associated with hyperthyroidism S. W. Wishart[1] has just described a case, which is one of six similar cases he has observed, in which paroxysmal auricular fibrillation proved to be the earliest sign of hyperthyroidism. The case described was that of a girl, aged 28, who during one year had six attacks of fibrillation at irregular intervals, the maximal duration being two days. In five of these an electrocardiographic examination was made, and this showed fibrillation with a rapid ventricular rate. On none of these occasions was there any clinical evidence of hyperthyroidism, and the basal metabolic rate was within the limits of normal on repeated estimation. At the end of one year this patient developed clinical signs of early Graves's disease, a sinus tachycardia of 110, and a basal metabolic rate of plus 40 per cent. Thyroidectomy was performed, and the gland showed the typical histological picture of Graves's disease. During the year following operation her health was excellent and there was no return of fibrillation. Wishart considers that auricular fibrillation and flutter are the irregularities most frequently met with in hyperthyroid conditions, and that these may be the earliest detectable signs of thyroid toxæmia. He argues that because removal of the thyroid causes an apparently complete recovery in the paroxysmal types, the changes in the heart muscle must be transient. This view is supported by the absence of subsequent cardiac enlargement or changes in the T-wave or the development of signs of cardiac failure.

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[1] Amer. Jour. Surgery, 1929, n.s., vii., 329.

AN EXPERIMENT IN CHILD GUIDANCE.

In the course of a recent discussion on the difficult child, reported in THE LANCET of Dec. 14th last (p. 1261), some speakers hinted that the pædiatrist was too often forgotten when psychiatrists, psychologists, and social workers set about the task of helping maladapted children. The Children's Clinic at 85 Clarendon-road, W.1, is an attempt to approach the problem from the pædiatrist's point of view. A fundamental belief underlying the work of the clinic is that physical and mental conditions are invariably associated, and there is a biochemical department to study the correlations between biochemical findings and nervous conditions. Another development of this belief is the gymnastic department; every child takes part in rhythmic exercises and free movements in order to give full value to the correlation between posture and habitual physical actions on the one hand and temperament and mental outlook on the other. On the psychological side the clinic has methods of its own which are not described in the report, beyond the rather vague statement that by special kinds of play the children are allowed and encouraged to work out their own problems and bring their difficulties to light. The situation is then explained as far as possible to the child, the parent, and the school teacher. As every child psychologist knows the parents are often the cause of the trouble, and the parent's department at this clinic is doing what it can to correct faulty adult attitudes. The mother is also taught what diet and hygiene is necessary to build up the child's physical health. There is a mother's room where mothers sit while they are waiting for their children, and where they form a club to discuss the virtues and vices of cinemas, the proper bedtime for small people, and such-like matters. At present the clinic is open only on two afternoons in the week and its work has to go on in rented rooms. Fifty-five children have been seen during the first year and there is a waiting list. The work is admittedly in an experimental stage but the experiment is worthy of a fair trial. For this a house is almost essential, and the report is issued with an urgent appeal for funds to equip this house and to provide proper remuneration for the staff.

AN INDIAN NATIONAL SCRIPT.

Dr. A. Latifi, LL.D., has written a brochure advocating a national script for India and the paper has been circulated by the East India Association. There is no doubt that the replacing in India of what the author calls a "jungle of scripts" is a pressing matter, for educational training is limited by the confusion, which has also the unfortunate result of limiting the number of European scholars who make personal research into Indian science. Dr. Latifi points out that there are three linguistic candidates for the provision of a national Indian alphabet, the Arabic, the Devanagri, and the Roman, and he finds the superiority of the Roman obvious. The Arabic script has, he reminds us, been tried and found wanting, while as between the Devanagri and the Roman the significant remark is made that Devanagri can in many respects be regarded as identical with Sanskrit, while Sanskrit can be intelligibly rendered into Roman. The details of a reformed script on the Roman pattern would naturally be left to the settlement of an expert committee, but for the use of those interested, as well as of such a committee, Dr. Latifi submits a scheme of his proposed translation into Roman Urdu.

A SURVEY OF BLINDNESS.

FOR the past four years the Colorado Commission for the Blind have been attempting to collect accurate information about the amount of blindness within the State. The result of their study together with the analysis of 150 private cases is reported by Dr. Edward Jackson,[1] of Denver. The 1053 cases reported to the Commission do not afford a complete record of blindness in the State, for all of the blind do not seek assistance, but their analysis is of unusual value inasmuch as the great majority of these cases have been examined for the commission by a specialist. All who do not conform to the standard of blindness—less than 1/10 vision in the better eye—have been excluded from the analysis. Cataract was the most important single cause (460 cases). Most of the cataracts were "senile." Opacities of the cornea were next in frequency (157 cases), this being the chief cause of blindness in 49 cases arising from trachoma. In 151 cases blindness was attributed to lesions of the retina and choroid, recognised by ophthalmoscopic examination. Atrophy of the optic nerve (132) was due certainly in 22 cases and probably in many more to syphilis. In three cases it came from drinking wood alcohol, and in others probably, it is said, from alcoholism and tobacco. There were 97 cases of glaucoma not sufficiently advanced to be classified under optic atrophy. Injury was the cause of blindness in 66 cases, high myopia clearly the cause in 43 cases, and probably in others. Dr. Jackson concludes that the majority of eyes that become blind could have been kept with some sight by early proper treatment. The prevention of blindness, he says, depends on (1) securing good treatment at the earliest possible time; (2) ability of physicians to diagnose disease that may lead to blindness when the eyes themselves seem to be little if at all affected; (3) the understanding that diseases which do not usually affect the eye may in some cases cause blindness and need to be watched with this in mind; and (4) the ability of oculists to recognise dangerous conditions and their willingness to make decisions and to operate when blindness can only be prevented by prompt medical intervention.

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[1] Amer. Jour. Ophthal., December, 1929, p. 965.

T.C.P.

A PREPARATION whose full style is Trichlorophenylmethyliodosalicyl has been put on the market by British Alkaloids, Limited, 104, Winchester House, London, E.C., as a general antiseptic and germicide, while there is evidence that as an electrolyte it has proved of value in the treatment by ionization of cases of arthritis. The preparation is testified to by many members of the medical profession as being non-toxic and analgesic, and a useful application as gargle or spray in affections of the nose and throat, and as a lotion in wounds and scalds as well as in eczema, chilblains, and hæmorrhoids.

A UNIVERSITY IN THE CAUCASUS.

To the Editor of THE LANCET.

SIR,—On Jan. 12th, 1930, the Baku (now Azerbaidjan) State University will celebrate its first jubilee. Born in the throes of civil war after the break-up of the old régime in Russia, this University has, during its 10 years of existence, become so bound up with the general and national culture of the country that Azerbaidjan can hardly be imagined without it. It opened with three courses in the medical faculty and the very beginnings of a philological faculty. Now there are the faculties of medicine, jurisprudence, and pedagogy; there are 2300 students, and the University has already given 1300 doctors to the Republic. The teaching in the faculty of pedagogy is in Turkish, whilst in the other faculties it is in Russian. The great majority of the scientific workers belong to the native population.

The nucleus of the University was a small group of professors, chiefly from the faculty of medicine (V. S. Razoumoffsky, I. I. Shirokogoroff, A.A. Oschmann, A. M. Levin) and from the former philological faculty, who, with part of the students from the medical faculty left, for objective reasons, the Transcaucasian University at Tiflis, in the full assurance that in Azerbaidjan they would find the best conditions for a continuance of their work. The prognosis was correct; at present the University is not only the cultural centre of Azerbaidjan, but is becoming a centre for the whole Union of Soviet Republics. In the not distant future it will be without doubt the vanguard of culture in the neighbouring countries of the East.

I am, Sir, yours faithfully,

I. SHIROKOGOROFF,
Professor of Morbid Anatomy.

Jan. 1st, 1930.

OCCIDENTAL MEDICAL BOOKS TRANSLATED INTO CHINESE.

Dr. Thomas Gillison is returning to China shortly at the age of 70, to continue his translation into Chinese of medical text-books. He is already responsible for the translation of Cunningham's Practical Anatomy, Luff's Chemistry, and Mitchell Bruce's Materia Medica. Dr. Gillison was from 1883 to 1918 principal of the London Missionary Society's Hospital at Hankow, and then joined the staff of the Shantung Christian College Medical School, one of the chief medical training centres in the East. In 1923 he returned to Hankow where he continued to work until his retirement last year. He holds the Chinese Order of the Excellent Crop.

Erratum.—In the list of New Year Honours published in THE LANCET last week the order conferred on Surgeon Rear-Admiral Robert William Basil Hall should have been recorded as the C.B. (Military Division).

MANCHESTER YEARLY INQUESTS.—The number of deaths reported to the Manchester City coroner during 1929 was 1368. Inquests were held in 452 cases. Motor fatalities amounted to 105, or 20 more than in the previous year. In Salford last year 219 coroners' inquests were held, and the largest number of them—42—concerned street accidents.

An Analysis
OF
POST-OPERATIVE PULMONARY COMPLICATIONS.

BASED ON CASES AT UNIVERSITY COLLEGE HOSPITAL, LONDON, IN ONE YEAR.

BY C. J. FULLER, D.M. OXF., M.R.C.P. LOND.,
PHYSICIAN TO THE ROYAL DEVON AND EXETER HOSPITAL: LATE MEDICAL REGISTRAR AT UNIVERSITY COLLEGE HOSPITAL.

THE series here presented was collected from the surgical wards of University College Hospital during 1927. As resident medical officer and later as medical registrar during that period I had unusual opportunities of examining the majority of the cases personally and thus avoiding the difficulties that arise in classifying observations made by others.

The total number of patients operated on during the year was 1478. The post-operative lung complications noted during that period are classified under the following headings:—

	Cases.
1. Bronchitis	24
2. Lobar pneumonia..	2
3. Broncho-pneumonia	75
4. Broncho-pneumonia with empyema	1
5. Broncho-pneumonia followed by infarction of the lung	1
6. Abscess of the lung	4
7. Massive collapse	8
8. Infarction of the lung	9
Total	124

I have, as far as possible, excluded chest complications which were not directly due to the operative procedure and which would have developed whether an operation was performed or not, as, for example, in cases of osteomyelitis.

In order that there shall be no ambiguity as to the above classification, I propose to give a brief description of each form of complication, illustrated by typical examples taken from the present series.

BRONCHITIS.

This type of post-operative chest complication is closely associated with the broncho-pneumonic group, the more severe cases of bronchitis merging directly into the milder types of pneumonia. It is, therefore, difficult to draw any distinction between the two groups; consequently I have included any cases in which consolidation was doubtful under the present heading.

There were 24 cases, a number that is probably lower than it should be owing to the fact that some of the minor cases escaped notice. The onset was commonly during the first two days after operation. It was accompanied by persistent coughing or a desire to do so. The sputum was at first scanty, but after 24 to 48 hours was expectorated in moderately large quantity. It was muco-purulent in the majority of cases and the presence of blood was unusual. The physical signs consisted of scattered rhonchi throughout both lungs with a slight impairment of percussion note at the lung bases in a few cases.

Of the 24 cases, 20 occurred after abdominal operations, 2 following the removal of a growth from the pharynx and 1 after each of the following: thyroidectomy and nephrolithotomy. There was one death in this group—namely, after removal of a pharyngeal carcinoma (4·1 per cent. mortality). A necropsy was not allowed.

CASE 1.—A man, aged 46, admitted on July 2nd with a duodenal ulcer which had perforated four hours previously. The ulcer was oversewn and a gastro-jejunostomy performed. The anæsthetic was ether, given by the open method. The patient had a slight temperature on the day of operation and a few scattered rhonchi in his lungs. On the first day after operation the temperature was further raised and was maximal on the second at 101·5° F., the respirations being at the rate of 40 per minute. The physical signs were impaired resonance over an area at the upper part of the right lower lobe and scattered rhonchi throughout both lungs. The sputum was muco-purulent, but contained no blood. The temperature returned to normal on the fifth day and the patient made an otherwise uneventful recovery.

LOBAR PNEUMONIA.

This group differed from the next and largest one, the broncho-pneumonias, in many ways. There were two cases and the disease was in both severe in character and led to a rapidly fatal termination. The physical signs were those of a massive rather than a patchy consolidation. The sputum was copious and rusty in colour. It is worthy of note that at the time these cases occurred there was an epidemic of mild influenza in the wards and the one in which they were was closed soon afterwards on that account. Whether these two cases were instances of true influenzal pneumonia or of lobar pneumonia I am uncertain. They were, however, definitely in a different category from the broncho-pneumonic group. The following description is of one in which a necropsy was obtained.

CASE 2.—A man, aged 65, admitted on Jan. 19th suffering from an acute strangulated femoral hernia. He complained of a chronic cough. At the operation, which was performed under open ether anæsthesia, the hernial sac was found to contain a gangrenous piece of small intestine. This was resected and an entero-anastomosis performed. The temperature rose on the first day after the operation, the maximum being on the second (103°), the day of the patient's death. He was cyanosed and breathing at the rate of 40 per minute. The pulse-rate was 130. Examination of the chest showed signs of consolidation at both lung bases. There was no displacement of the heart. The sputum was copious, rusty, and frothy.

The *necropsy* was performed eight hours after death. Both lower lobes were airless, engorged with blood, and on section exuded a creamy mixture of blood and pus. Scattered about were numerous pale areas, raised, and consisting of necrotic lung tissue. The upper lobes contained air, and exuded blood and œdema fluid on pressure. The right lung was more affected than the left. The aorta, endocardium, and other structures were stained a bright red. Sections of the lungs showed the alveoli to be filled with exudate containing large numbers of leucocytes, Gram-positive diplococci, and short-chained streptococci. In some places the alveolar wall was disappearing.

BRONCHO-PNEUMONIA.

The third is by far the largest group of the series and consisted of 75 cases. It is from the numbers of this type that the percentage incidence of post-operative chest complications is higher than in any recently published series. All cases included under this heading showed unmistakable signs of pneumonic consolidation either clinically or in the post-mortem room. Clinically the condition was recognised by impaired resonance to percussion, weak or tubular breath sounds, râles, and an alteration in the vocal resonance, which was sometimes aegophonic and at others diminished. This consolidation was, without exception, found in the lower lobes of one or both lungs. In many cases it was associated with a diffuse bronchitis.

The course of the disease was characteristic. There was a moderate rise of temperature on the first or second day after the operation accompanied by a corresponding increase in the pulse-rate. The respirations were quickened to a slightly greater degree, as would be expected in a pneumonia. The patient at this period often complained of a tight sensation in the chest and a desire to cough, which he was unwilling to gratify owing to the resulting pain in the operation wound. The onset was in some cases delayed to the third, and in one case to the fifth, day after operation. The temperature fell by lysis and in uncomplicated cases had returned to normal by the sixth to tenth day. The sputum was as a rule copious, purulent, and contained no blood visible macroscopically.

A point of interest is the rapidity of the onset in this type of post-operative complication. It would not be justifiable to claim the rise of temperature on the first day after the operation as due to the chest condition, but there can be no doubt that a fully developed pneumonia can be present on the second day, as is shown by Case 3 quoted below.

In Table I. I have placed the first and second days together owing to the difficulty of distinguishing a reactionary temperature due to the operation from that caused by the pneumonia.

TABLE I.

Day of onset.	Number of cases.
First and Second	69
Third	2
Fourth	0
Fifth	1
Doubtful	3
Total	75

This complication occurred after two main classes of operation, the first being those involving the anterior abdominal wall and by this route the peritoneal cavity, in particular the upper abdomen, the second being major operations on the mouth, pharynx, and upper respiratory passages.

Table II. gives the incidence of broncho-pneumonia in the present series :—

TABLE II.

Operation.	Cases	Pneumonias.	Deaths.	Mortality % of morbidity.
Abdominal ..	610	58 (9·5 %)	9 (1·4 %)	15·8
Mouth, pharynx, and larynx ..	52	9 (17·3 %)	9 (17·3 %)	100
Bladder and prostate (suprapubic) ..	34	3 (9·0 %)	1 (2·9 %)	33·3
Miscellaneous ..	—	5	2	40
Total ..	—	75	21	28·0

CASE 3.—Male, aged 41, admitted on August 2nd, 1927, complaining of acute pain in the abdomen. Operation showed a perforated duodenal ulcer; this was oversewn. The anæsthetic was ether, given by the open method. Nothing abnormal was detected in the heart and lungs before operation. There was no previous history of chronic chest trouble.

The temperature rose to 99·4° F. on the first day after operation. The maximum was 101° F. on the second day. It had returned to normal by the fifth day. The maximum respiration-rate was 40 per minute. Examination of the chest showed diminished movement, impaired percussion note, and weak breath sounds at the right base behind. Râles were heard at both bases, and the vocal resonance at one spot at the right side was nasal in character. The sputum was scanty and purulent. Patient died on the seventh day.

Post mortem.—The lungs showed very severe broncho-pneumonia at the lower and posterior parts of both lower lobes. The mucous membrane of the bronchi was hæmorrhagic. A small amount of sero-fibrinous fluid lay between the coils of gut and the stomach showed evidence of recent and old gastritis. The ligatures closing the ulcer were holding well. Sections of the lung showed severe, almost confluent, broncho-pneumonic consolidation, the alveoli being filled with exudate containing large numbers of polymorphonuclear leucocytes and many red blood-cells. The bronchi were filled with pus.

Case 3 is a typical example of one following abdominal surgery. There is little doubt that the peritonitis contributed to the fatal termination, but the clinical and post-mortem findings of a broncho-pneumonia at the posterior parts of the lung bases is the characteristic feature of the group in general. Microscopically, the appearance is indistinguishable from the so-called hypostatic pneumonia occurring in patients dying from such conditions as cerebral hæmorrhage and wasting diseases, and it appears to me that the clinical signs bear a close resemblance to one another.

Complications of Broncho-pneumonia.

(*a*) *Empyema.*—There was one case of empyema in the series—a man with an epithelioma of the tongue. The operation was done in two stages, the first a gland operation, the second for removal of the growth. The first operation was performed without any complications, but ten days after the second an empyema was diagnosed, opened and drained. The patient died seven weeks later from general dissemination of the growth.

(*b*) *Infarction.*—The following case is interesting in that it exhibits two types of post-operative lung complication.

CASE 4.—The patient was a woman, aged 58, operated on for carcinoma of the pyloric end of the stomach. After the operation she developed a typical post-operative broncho-pneumonia, which had almost resolved by the eighth day after operation. On the ninth she developed a femoral thrombosis, and three days later pain in the right side of the chest, blood-stained sputum, and later a well-marked friction rub.

(*c*) *Pulmonary Abscess.*—There were three such cases complicating broncho-pneumonia, but I am including one other, which I believe to be the sequela of a pulmonary infarction, making the group up to four. Three followed upper abdominal operations and one the drainage of a perinephric abscess. In the case of those complicating broncho-pneumonia, the course was typical of that condition for the first few days. Subsequently the temperature did not fall to normal as in an uncomplicated case, and examination of the chest showed signs of cavity formation confirmed radiologically in each instance.

CASE 5.—A man, aged 41, admitted on August 18th suffering from a duodenal ulcer. His lungs were emphysematous. A posterior gastro-jejunostomy was performed under open ether. The operation lasted 43 minutes. The patient had an acute dilatation of the stomach on the first day after operation. He was treated with subcutaneous saline and improved. On the fourth day after operation his temperature rose to 103·4° F., with a gradual downward trend until the thirty-second day, when it reached normal. On examination at the onset of the pneumonia the physical signs were a slight impairment of percussion note at the left base with weak breath sounds at both. The cardiac dullness was diminished, and the air entry below normal over the front of the chest owing to the emphysema. Two days later the breath sounds had decreased still more at the bases, particularly on the left side. The sputum was scanty and muco-purulent. In a further three days' time the breath sounds had become inaudible and the patient was expectorating a foul-smelling, brown-coloured sputum. From that time the signs gradually became less marked, and the patient improved. A radiogram showed a small circular shadow at the left base which in subsequent pictures became less opaque. The sputum contained pneumococci and a coliform bacillus on culture.

MASSIVE COLLAPSE.

Of the next type of complication—namely, massive collapse—there were eight cases in the series. The main physical sign on which I based my opinion was the displacement of the heart towards the side of the lesion, and without this cardinal sign of the condition I did not feel justified in making the diagnosis.

The onset was characteristic. Within three or four days of the operation the patient's temperature rose suddenly. He complained of a tight feeling in the chest and appeared to find some relief by lying on the affected side. Physical examination showed displacement of the heart towards the side of the lesion, with diminished movement, impaired percussion note, and weak or absent breath sounds. These signs remained unchanged, with the exception of the breath sounds, which frequently became of a tubular quality associated with an ægophonic vocal resonance. The temperature fell to normal again in the course of about a week, but signs of the collapse persisted for several days longer. Radiographically, displacement of the mediastinal contents was well shown with a uniform shadowing of the affected lobe of the lung. The sputum was purulent, somewhat viscid, and varied in amount. A detailed description will be found in W. Pasteur's[1] classical paper in which he points out the frequency of the condition following operations.

In the present series this complication occurred five times after an abdominal operation, twice after nephrectomy, and once after hemilaryngectomy. The last case was not diagnosed until the autopsy; death took place on the second day.

The following is given as a typical example of massive collapse.

CASE 6.—The patient was a girl, aged 15, admitted on Nov. 22nd, with signs of obstructive uræmia. She had passed little urine for several days before admission. The pulse-rate was rapid, and examination of the lungs revealed *the presence of generalised bronchitis.*

The day after admission she began to pass large quantities of urine and improved rapidly. A radiogram of the renal tract showed stones in both kidneys.

Three weeks later the stone of pure cystin was removed from the left kidney under open ether anæsthesia. Her temperature rose on the first day after the operation and remained above normal for six days, the maximum being 103° F. On the fourth day she complained of considerable pain and a sensation of tightness in the left side of her chest. Examination on the following day showed marked displacement of her heart to the left, diminished movement, dullness, and tubular breath sounds at the left lung base. These signs cleared slowly. The sputum was small in quantity, purulent, and viscid.

INFARCTION.

The last group of the series comes into a totally different category, and I have included them in the present paper in order to emphasise this difference. Although they are undoubtedly post-operative chest complications, they fall into the group of pulmonary embolisms, which in the grosser forms are so fatal. The point of difference which I particularly wish to emphasise is the period which elapses between the operation and the occurrence of the condition. In no case of the nine in the series did this complication arise before the seventh day. The onset was marked by a sharp, stabbing pain in the chest made worse by taking a deep breath, and coincident with this there was a slight rise of temperature for two or three days. The sputum, if present, was scanty and stained with bright red blood. Examination of the chest showed the presence of a friction rub, with a *slight impairment of percussion note over the same area* in the more severe cases. The following is a typical example.

TABLE III.

—	—	No. of cases.			Chest complications.						Mortality.	
					Number.			Percentage.				
		Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	Per cent.
A.	Upper abdominal—											
	1. Perforated gastric or duodenal ulcer ..	20	19	1	8	7	1	40·0	36·8	100	1	
	2. Other gastric operations	94	70	24	27	22	5	28·7	31·4	20·8	3	
	3. Operations on the biliary apparatus.. ..	36	9	27	5	0	5	13·9	0	18·5	2	
	4. Splenectomy	4	3	1	1	1	0	25·0	33·3	0	0	
	5. Gastrostomy for carcinoma of œsophagus ..	23	20	3	0	0	0	0	0	0	0	
	6. Others	4	3	1	0	0	0	0	0	0	0	
	Total ..	181	124	57	41	30	11	22·6	24·2	19·3	6	3·3
B.	Lower abdominal—											
	1. Appendicectomy (acute)	107	65	42	14	12	2	13·1	18·4	4·7	2	
	2. Appendicectomy (chronic)	44	19	25	5	3	2	11·3	15·7	8·0	0	
	3. Umbilical and ventral herniæ											
	(*a*) Strangulated and internal strangulation	8	4	4	3	3	0	37·5	75·0	0	1	
	(*b*) Non-strangulated	20	9	11	1	0	1	5·0	0	9·0	0	
	4. Inguinal and femoral herniæ—											
	(*a*) Strangulated	18	11	7	4	4	0	22·2	36·3	0	2	
	(*b*) Non-strangulated	132	98	34	14	12	2	10·6	12·2	5·8	0	
	5. Laparotomies (various)	100	51	49	6	5	1	6·0	9·8	2·0	0	
	Total ..	*429*	*257*	*172*	*47*	*39*	*8*	*10·9*	*15·2*	*4·6*	*5*	1·1
C.	Rectum and anus (perineal route)	49	31	18	1	1	0	2·0	3·2	0	0	0
D.	Bladder and prostate (suprapubic)	34	34	0	3	3	0	8·8	8·8	0	1	2·9
E.	Kidney and ureter (lumbar incision)	35	17	18	4	2	2	11·4	11·8	11·1	0	0
F.	Radical amputation of breast	46	0	46	1	0	1	2·2	0	2·2	0	0
G.	Partial thyroidectomy	52	5	47	1	0	1	1·9	0	2·1	0	0
H.	Major head operations, excluding section "I" ..	20	?	?	1	0	1	5·0	?	?	1	5
I.	Major operations on mouth, pharynx, and larynx ..	52	39	13	13	12	1	25·0	30·8	7·7	12	23·1
J.	Miscellaneous	580	?	?	3	3	0	0·5	—	—	1	0·17
	Grand total ..	1478	507*	371*	115	90	25	7·8	—	—	26	1·8

* These figures are incomplete, as I considered it unnecessary to give the number of male (M.) and female (F.) cases in this category.

CASE 7.—A man, aged 55, admitted on Dec. 12th for removal of the gall-bladder for cholecystitis. The operation was performed under open ether anæsthesia. The convalescence was uneventful until the fourteenth day, when he was seized with a sharp pain in the left side of his chest. There was a slight rise of temperature for five days, and a small amount of sputum was expectorated. Examination of his chest revealed the presence of a friction rub on the left side.

PREDISPOSING CAUSES.

Table III. gives an analysis of the number of chest complications, excluding pulmonary infarctions, occurring after various operations. The percentage in this series is considerably higher than in any other recently published. But as Churchill[2] points out there has been a tendency for the numbers to rise during recent years, probably on account of a more careful study of the condition.

Site of operation.—As all other investigators have found, the type of operation which is most frequently followed by post-operative chest complications is the one involving the upper abdomen. In the present series there were 181 operations, of which 41 were followed by a lung complication (22·6 per cent.). On closer analysis of this group it was found that the highest percentage was given by the perforated peptic ulcers (40 per cent.), the next by the other operations involving the stomach and duodenum (28·7 per cent.), excluding gastrostomy. This latter operation was in every case performed under local anæsthesia, was relatively of short duration, and the amount of shock was small.

The lower abdominal operations were the other large group in which lung complications were common. Here, although the total number of complications is greater than that in the upper abdominal group, the percentage is slightly less than half (10·9 per cent.). The other types of operation following which a high percentage was noted were renal operations (11·4 per cent.), prostatectomies (8·8 per cent.), and operations on the mouth, pharynx, and upper respiratory passages (25 per cent.). It is noteworthy that in the case of radical amputation of the breast, thyroidectomy, and major head operations, the incidence was extremely low, being in the first two instances only 2 per cent., and in the last 5 per cent. These figures are significant in that they refer to operations which are as a rule lengthy and in the case of the breast involve the exposure of a large area of tissue.

From these data it appears clear that there are two classes of operation which have the greatest number of chest complications—namely, those involving the peritoneal cavity and those on the mouth, pharynx, and the upper respiratory passages. To this generalisation there is one exception, the operations on the urinary tract. These have been divided for purposes of classification into two groups, upper and lower. In the case of the former the explanation appears to be that the operation necessitates interference with structures in close proximity to the diaphragm and with the muscles employed in the act of coughing (latissimus dorsi).* In the latter instance operations such as prostatectomy are often of necessity undertaken in cases where there is severe damage to renal function. It is well known that such a condition is a predisposing factor towards the development of pulmonary infections.

Lowered resistance.—Operations in which the peritoneum was opened show that, the patients in whom it would be reasonable to expect a considerable amount of shock before operation—to wit, the "acute abdomens," are those in whom the incidence is high when compared with operations of a similar nature when conditions are most favourable. The difference is well shown by a comparison of the case incidence between perforated peptic ulcers (40 per cent.) and other gastric operations (28·7 per cent.); and again by strangulated ventral and umbilical hernias (37·5 per cent.); and similar cases where there was no strangulation (5 per cent.). There is only a negligible difference between appendicectomies whether performed for an acute or chronic condition. This is intelligible, as the shock in a patient suffering from an acute appendicitis is not marked when those cases which have progressed to a general peritonitis, an uncommon complication, are excluded.

Preoperative lung infection.—The presence of an infection of the lungs before operation appears to be of considerable importance as a possible ætiological factor. There were no notes relative to this point in 37 of the 115 cases (infarctions excluded). I was able to discover a history of either recent or long standing respiratory tract infection in 40 (35 per cent.), and in 23 of the 41 cases physical signs of such an infection were found in the lungs before operation. Amongst other investigators Elwyn[3] has noted a high percentage (25) of preoperative lung complications.

Time of year.—The monthly incidence of complications taken throughout the year in this series gives little information of value owing to great variations from month to month. If, however, the six winter months, October to March (inclusive), are compared with the corresponding summer ones, an appreciable difference is found, there being 65 in the former and 50 in the latter.

Age incidence.—An analysis of the age incidence of post-operative chest complications reveals the fact that in upper abdominal operations 39 per cent. occur in the fifth decade. The majority of this group were patients suffering from gastric or duodenal ulcers, a condition which occurs at a slightly earlier age. The lower abdominal had a more diffuse maximum, 23·4 per cent. occurring in both the fourth and sixth decades and 17·5 per cent. in the fifth. This group included a varied assortment of operations formed in large part by cases of appendicitis and inguinal and femoral hernias. I show these data in Table IV. Abdominal operations only are given as the other groups are not sufficiently large to serve any useful purpose.

From these observations it appears that one is not justified in drawing any definite conclusions as to the part which age plays in predisposing towards the condition. There is no doubt that it is uncommon before the age of 20, but it is equally true that the type of operation, following which this complication is most common, is more frequently performed in the subsequent decades. Nevertheless, I think one may say that age, in so far as it diminishes the power of an individual to withstand the ill-effects of an operation, has a *predisposing influence towards lung complications.*

TABLE IV.

Age in years.	Number of cases.	
	Upper abdomen.	Lower abdomen.
0 to 9	0	0
10 to 19	1	5
20 to 29	4	11
30 to 39	9	8
40 to 49	16	11
50 to 59	9	5
60 to 69	1	5
70 to 79	0	0
80 to 89	0	1
doubtful	1	1
	Total 41	Total 47

Length of operation does not seem to bear any intimate relation to the occurrence of the condition, as is shown by the fact that there was an incidence of 13·1 per cent. in acute appendicitis and 10·6 per cent. in the case of non-strangulated inguinal and femoral hernias, whereas radical amputation of the breast and partial thyroidectomy, both severe and relatively lengthy operations, had a percentage of only 2·1 and 1·9 respectively. This difference may be accounted for in part, but certainly not wholly, by the fact that the latter two groups were largely female.

Sex Incidence.—This brings me to the observation made by many previous observers that the condition is more common in males than females. In this series, of the 115 cases 90 were males and only 25 females. These figures are rather misleading, however, as the number of operations of a type that was followed by chest complications was greater in the former (504) than in the latter (369). The incidence, therefore, was 17·8 per cent. and 6·8 per cent. respectively.

Anæsthetic.—Table V. gives the number of anæsthetics given during the year with the corresponding number of chest complications following each. The custom at this hospital is to administer ether in some form or other unless it is contraindicated. The percentages, therefore, must not be taken at their face value, as gas-and-oxygen or local anæsthetic was given to a few cases for the very reason that a lung complication was to be feared after the operation.

TABLE V.

Anæsthetic.	Cases.	Chest complications excluding infarctions.	Per cent.
Ether	1332	93	6·9
Chloroform ..	204	14	6·8
Local and regional	179	7	3·9
Gas-and-oxygen ..	16	1	6·2
Total.. ..	1731	115	—

The number of cases in which gas-and-oxygen was employed is too small for any reliable conclusions to be drawn. In this class I have not included any minor operations such as tooth extraction, as I considered that such operations had no place in such a series. This will explain the otherwise inexplicably small number in which nitrous oxide was used.

Of the 14 cases in which chloroform was used no less than eight were operations on the mouth, pharynx, and larynx, sites which have been previously shown to be frequently followed by respiratory complications. There were four instances in abdominal operations, but the age, 82, in one of them would probably be prejudicial to an uncomplicated convalescence.

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* This suggestion is borne out by the observations of the sisters in charge of the wards, who, owing to the nature of their work, have an unrivalled opportunity of watching the patients.

Local and regional anæsthesia was followed by broncho-pneumonia or bronchitis in seven instances. Of these, four had definite evidence of preoperative abnormality in the chest and two a suggestive history, although nothing abnormal could be found. The operations were of the lower abdominal type in all but one case.

Reference to Table V. shows that regional and local anæsthesia is followed by chest complications in 3·9 per cent. of cases as compared with 6·9 per cent. after ether, but a strict comparison cannot be made on account of the small number in the former.

MODE OF INFECTION.

There appears to be little difference of opinion between various observers as to the variety of post-operative lung complications that may occur. To put them briefly there are the pneumonias, the lobular type being by far the most common, with their attendant complications, such as abscess, empyema, and delayed resolution, which, together with bronchitis, form the majority of the cases. In a rather more doubtful group are the cases of massive collapse, and finally there are the undoubted cases of infarction of the lung.

Taking the group of bronchitis, broncho-pneumonia and its complications, it is obvious that there must be some source from which the infection arises. There are two possible theories: (1) that the infecting organisms are carried to the lung from the site of operation; (2) that the organisms are already present in the lung, or gain access to the lungs by the respiratory tract.

The supporters of the first theory must be divided into two groups. Cutler and Hunt [4] hold that the infection is carried by numerous small emboli either by the blood stream or the lymphatics from the site of operation. From the fact that the condition is most frequent following abdominal surgery they suggest that the continual movement of the anterior abdominal wall necessitated by the act of respiration serves to dislodge these emboli from the smaller vessels. This bombardment of the lungs by these infected emboli sets up an inflammatory reaction, which results in post-operative broncho-pneumonia. Razemon,[5] on the other hand, holds the view that the infecting organisms gain entrance to the lung by a lymphatic route. He points out the great number of cases which follow upper abdominal surgery, particularly operations on the stomach and duodenum, and claims to have isolated organisms from the sputum of patients suffering from post-operative pneumonia which are characteristic of that part of the alimentary tract. He suggests that the infecting organisms pass by means of the diaphragmatic lymphatics and thence through the thoracic duct to the great veins in the neck. From there they pass through the right side of the heart to the lungs, where they are filtered out. In support of the hypothesis he repeated the experiments of Bolton [6] and others on the absorption of bacteria and other minute particles by way of the lymphatics of the diaphragm.

The embolic theory put forward by Cutler and Hunt [4] would seem to meet with several objections. There is a class of post-operative lung complication which is undoubtedly due to embolism of a minor degree and which is described in papers on that subject in the same group as the cases of pulmonary embolism which result in sudden death (Lockhart-Mummery).[7] In the present series I have collected nine such cases. They have a well-known clinical course and tend to come on during the second week of convalescence from operation in the majority of cases. In this series there was not one which appeared before the seventh day.

There is no definite evidence as to the origin of the emboli. Whether they arise from the veins near the site of operation or from those of the pelvis or lower limbs has not yet been settled by the investigators of this question, but it appears to me that the picture presented by this type of case is different in many respects from that shown by post-operative broncho-pneumonia. The latter condition appears in a remarkably short time after the operation, is not characterised by the acute onset of a pulmonary infarct, and the signs and symptoms of pleurisy are rather the exception than the rule. Again, the sputum, although blood-stained in a few cases, is expectorated in moderately large quantities, and is definitely purulent in all cases.

The appearance produced by septic emboli in the lungs is nowhere better illustrated than by those cases of suppurative phlebitis of the lateral sinus following mastoiditis, or again by some cases of osteomyelitis which come to a fatal termination. Here multiple abscesses are found scattered throughout both lungs, and there would appear to be no predilection for the bases.

Armstrong and Gaskell [3] in their researches on the pneumococcal infection of the human lung state that in their opinion both lobar and broncho-pneumonia are air-borne infections, and that the factors determining the type which occur are the virulence of the infecting organism and the resistance of the host. A blood-borne infection of the lung by pneumococci they term miliary pneumonia. In this type changes in the bronchioles or bronchi are either absent or slight in comparison with those in the alveoli. These conclusions are supported by histological evidence and experimental production of pneumonia in rabbits by intratracheal insufflation of varying strains of pneumococci. From these facts it would seem unlikely that multiple embolism will explain the pathogenesis of post-operative pneumonia.

It appears to me that the grounds on which Razemon[5] bases his conclusions are also inadequate, as the bacteriological study of sputa obtained from patients who have recently undergone an operation is of little value. The organisms of the upper alimentary tract will in all probability be present from post-operative vomiting whether the patient be suffering from pneumonia or not.

The other possible mode of entry for infecting organisms is by the respiratory tract. In the first place, no one will deny that the inhalation of septic material into the respiratory passages is capable of producing an extremely severe type of pneumonia. This is well exemplified by the cases of post-operative pneumonia following operations on the mouth, pharynx, and larynx. The numbers are admittedly small, but the percentage (25) is sufficiently high to be worthy of note. Again, there is definite clinical evidence of a pre-existing chest infection in 19·6 per cent. of the 115 cases in this series and a history of either recent or chronic infection in no less than 35 per cent. Therefore it will be seen that there is a considerable number of cases in which one is justified in assuming a respiratory tract infection either before, during, or after the operation. There must be, however, other factors, and in attempting to find an explanation I was struck by the closely analogous condition of so-called hypostatic pneumonia. This type of inflammation of the lungs occurs, as is well known, in cases of wasting diseases frequently unconnected with the respiratory system.

The reason is apparent. In these cases we have patients who are for some reason or other unable to withstand a respiratory tract infection which has manifestly not arisen from any operative procedure, and there is no reason to suppose that they were infected from without by pathogenic micro-organisms. The cases are those of patients enfeebled either by old age, a chronic wasting disease, or a severe illness. In addition, such patients lie still in bed with the minimum amount of movement and take extremely shallow respirations. I would particularly emphasise instances of diaphragmatic paralysis and quote the following example at length:—

CASE 8.—A man, aged 22, who was admitted on Oct. 20th, 1926, suffering from acute anterior poliomyelitis. On admission there was complete paralysis of both legs and the right arm, which had been present for four days. Twelve hours later the paralysis had involved the diaphragm, and respirations were carried on by weakly acting intercostal and the accessory respiratory muscles. The patient was breathing rapidly and was extremely cyanosed. He died two hours later.

Post mortem, the lungs showed numerous hæmorrhages and some emphysema. There was a blood-stained froth in the trachea. The bases showed a patchy broncho-pneumonia and subpleural collapse. Heart normal. Congestion of the liver. Brain showed congestion of the blood-vessels and a few subarachnoid hæmorrhages.

Sections of the lungs showed a hæmorrhagic broncho-pneumonia.

The changes in the brain and cord were typical of anterior poliomyelitis and polio-encephalitis.

Here it will be seen that a broncho-pneumonia was present in addition to the small areas of collapse. Pasteur [1] has emphasised the occurrence of the latter condition in similar cases, especially in post-diphtheritic diaphragmatic paralysis.

It would appear that the procedure involved in operations, particularly those on the upper abdomen, tends to reproduce the conditions necessary for the production of such a pneumonia. The patient has been subjected to treatment which tends to lower his resistance to any infecting organisms present in his respiratory tract, and on recovering from the anæsthetic is conscious of a pain in his abdomen which is made worse by any attempt at coughing or taking a deep inspiration.

The respiratory movements which are most involved are those of the diaphragm, which, as was shown by Keith,[9] are responsible for the ventilation of the bases and posterior parts of the lungs, and it is this movement which is especially painful to patients who have undergone an upper abdominal operation. It is interesting to note the relatively high percentage (11·4) of post-operative complications following renal operations, which involve the structures in the region of the pillars of the diaphragm and the latissimus dorsi muscles. Drummond,[10] in 1898, notes that patients who made the most successful attempts at coughing made the best progress.

In support of the contention that inhibition of the diaphragmatic movements occurs may be cited Churchill and McNeil's[11] observations on the vital capacities of patients before and after operation. They found that the vital capacity on the first day after operation was of the following order:—

Gall-bladder operations	25	Per cent. of the preoperative capacity.
Chronic appendicitis ..	60	
Inguinal hernia (Bassini)	50	
Non-abdominal	100	

These observations appear to be of the first importance and demonstrate the marked effect that an abdominal operation has on the ventilation of the lungs especially in the case of the upper abdominal group. In addition to this Christie and Beams's[12] experiments on the vital capacity of subjects lying down and sitting are illuminating. They found that in a series of 290 normal men and women there was a decrease of 5·5 per cent. in the prone as compared with the sitting posture. This, as would be expected, was accentuated in obese women.

There are therefore three main conditions necessary for the production of a post-operative pneumonia: (1) The presence of organisms in the lungs, either before the operation or aspirated during the period of unconsciousness at operation or soon afterwards. (2) The inhibition of the respiratory movements and in particular those of the diaphragm consequent on the surgical procedure. (3) The lowering of the patient's resistance.

Turning to the actual pathological process by which the pneumonia is produced apart from the route of infection, which has already been discussed, Elwyn [3] has suggested that the pneumonic consolidation is preceded by areas of collapse in which the infecting organisms find a "locus minoris resistantiæ." Churchill [2] has, however, pointed out the fact that pneumonia is an extremely rare complication of collapse of the lungs when produced artificially, such as with a pneumothorax for pulmonary tuberculosis or bronchiectasis, conditions in which there is a severe infection of the pulmonary tissue. From my own personal experience of this method of treatment I can substantiate this statement.

Mastics, Spittler, and McNamee,[13] and more recently Boland and Sheret,[14] have gone a step further and claim that a very large proportion of all post-operative lung complications are in reality varying degrees of collapse of the lungs. In answer to this conception I would point out the fact that it is a common occurrence to find lungs from patients dying shortly after operation with broncho-pneumonia in which there is no evidence of collapse, and although the occurrence of pneumonia together with areas of collapse is by no means a rarity, it would seem improbable that the collapse predisposes to the pneumonia.

A more likely explanation appears to be that the pneumonia is preceded by an infection of the bronchioles as has been demonstrated by Armstrong and Gaskell [8] in the case of a broncho-pneumonia of a pneumococcal origin, and should the exudation into the bronchi be of sufficient viscosity and allowed to remain owing to the inhibition of the cough reflex, a collapse will result. This conception agrees with that of Elliott and Dingley,[15] who showed that the blocking of the bronchi by inflammatory secretions was the most probable explanation of the phenomenon of massive collapse. That these secretions are capable of producing a collapse has been shown by Lee, Tucker, and Clerf,[16] who brought about the condition in dogs by introducing the bronchial secretion of a patient with the disease or a solution of gum acacia of a similar viscosity, the cough reflex having first been inhibited by drugs.

TREATMENT.

The treatment naturally divides itself into two phases: (1) prophylactic and (2) curative. The first may be divided into treatment before, during, and after operation. In my opinion greater attention should be paid to the examination of the chest for evidence of inflammation of the respiratory tract and a closer inquiry into the history of recent coughs and colds. At operation every effort should be made to protect the patient from exposure to circumstances which tend to lower his resistance, and during the first two or three days after operation the patient should be encouraged to move himself as much as circumstances will permit, and to practise taking deep inspirations. With the latter point in view, during the year 1928, patients in two wards, one male and one female, were instructed to blow water from one Woulfe's bottle into another connected to it by rubber tubing, the underlying idea being that the effort would induce deeper inspirations and thus reduce the area of inactive lung. The results were compared with those from two similar wards in which respiratory exercises were not given. They are as given in Table VI.

TABLE VI.

Type of operation.	Wards in which exercises were employed.			Wards in which no exercises were employed.		
	Cases.	Complications.	Per cent.	Cases.	Complications.	Per cent.
Upper abdomen	82	19	23·3	48	8	16·6
Lower abdomen	153	16	10·6	154	12	7·7

I have only included abdominal operations owing to the fact that the other types were in too small numbers. The results of this treatment are disappointing as any difference that is shown is in favour of the untreated class. The real reason for the failure is that the method takes no account of the human element. The average patient will not take inspirations, if such respirations are going to cause him considerable pain.

A further attempt to aerate the lungs was made by giving the patients a mixture of 50 per cent. CO_2 in air delivered through a nitrous oxide gas apparatus 24 hours after the operation. It was found that the patients would not tolerate the administration; it was too reminiscent of the operation they had just undergone. Scott and Cutler[17] published a preliminary report advocating the use of CO_2 as a prophylactic measure against massive collapse. The percentage of the gas was varied at the discretion of the administrator. It was given immediately after the operation, during the unconscious period, and would overcome my difficulty.

More recently Scott,[18] Coryllos,[19] and Yandell Henderson[20] have published papers emphasising the usefulness of CO_2 in the treatment of massive collapse and post-operative pneumonia. At this hospital the method is being given a trial, but so far no statistical evidence is obtainable.

The curative treatment of post-operative lung infections again resolves itself into an attempt to re-expand the lung bases, and similar methods to those outlined above may be tried. In addition, an expectorant mixture to assist in the coughing up of sputum is useful. Other treatment is purely symptomatic.

CONCLUSIONS.

(1) Post-operative chest complications may be divided into two groups: *(a)* Those due to an infection of the lungs and resulting in bronchitis, broncho-pneumonia, and their complications. *(b)* Those due to pulmonary embolism and resulting in either infarction of the lung or sudden death of the patient.

(2) Post-operative bronchitis and broncho-pneumonia are the result of an infection which reaches the lungs by way of the respiratory tract and which is either present before the operation or gains entrance thereto during or soon after the operation. General anæsthetics are in this way indirectly responsible for post-operative chest infections, because infected material may be aspirated during their administration.

(3) The other important factors are the lowering of the patient's resistance and the stagnation in the lower lobes of the lungs caused by the position of the patient and the immobility of the diaphragm and during the first two or three days after operation.

(4) Massive collapse of the lung is probably of a similar ætiology to post-operative pneumonia, but there is no reason to believe that it is an essential predisposing cause to the pneumonia.

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BIBLIOGRAPHY.

1. Pasteur, W.: THE LANCET, 1908, ii., 1351.
2. Churchill, E.: Arch. of Surg., 1925, ii., 489.
3. Elwyn, H.: Jour. Amer. Med. Assoc., 1922, lxxix., 2154.
4. Cutler, E. C., and Hunt, A. M.: Arch. of Surg., 1920, i., 114.
5. Razemon, P.: Rev. de Chir., 1926, xlv., 156.
6. Bolton, C.: Jour. Path., 1921, xxiv., 429.
7. Lockhart-Mummery, J. P.: Proc. Roy. Soc. Med. (Sect. Surg.); 1921–22, xv., pt. 3, p. 23.
8. Armstrong, R. R., and Gaskell, J. F.: Jour. Path., 1921, xxiv., 369.
9. Keith, A.: Further Advances in Physiology, edited by Leonard Hill, 1910, London, p. 182.
10. Drummond, D.: Brit. Med. Jour., 1898, ii., 939.
11. Churchill, E. D., and McNeil, D.: Surg., Gyn., and Obst., 1927, xliv., 483.
12. Christie, C. D., and Beams, A. J.: Arch Int. Med., 1922, xxx., 34.
13. Mastics, E. A., Spittler, F. A., and McNamee, E. P.: Arch. of Surg., 1927, xv., 155.
14. Boland, C. R., and Sheret, J. E.: THE LANCET, 1928, ii., 111.
15. Elliott, T. R., and Dingley, L. A.: THE LANCET, 1914, i., 1305.
16. Lee, W. E., Tucker, G., and Clerf, L. H.: Annals of Surg., 1928, lxxxviii., 6.
17. Scott, W. J. M., and Cutler, E. C.: Jour. Amer. Med. Assoc., 1928, xc., 1759.
18. Scott, W. J. M.: Ibid., 1929, xciii., 101.
19. Coryllos, Ed. N.: Ibid., p. 98.
20. Henderson, Yandell: Ibid., p. 96.

THE ACTION OF
ALCOHOL UPON THE BLOOD-SUGAR IN DIABETES MELLITUS.

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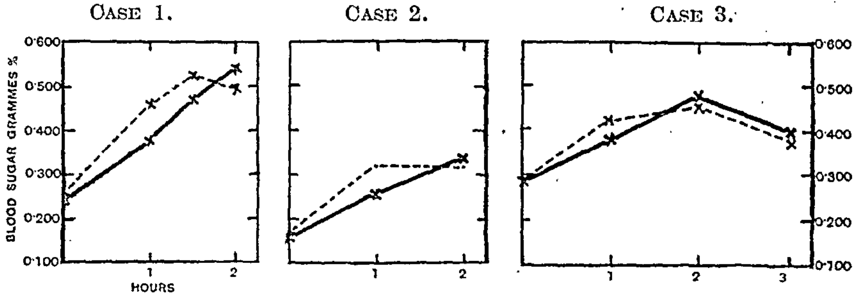
THERE is considerable difference of opinion about the value of alcohol in the treatment of diabetes mellitus, but that it has a use in this condition can hardly be doubted. Since alcohol can spare fat, approximately in the ratio of the calorie values of the two substances—i.e., 7 to 9—it must clearly be considered a valuable foodstuff, and since there is no evidence that it can itself form carbohydrate in the body, it appears at first sight to be a particularly suitable source of energy in diabetes. Few clinicians, however, are prepared to lay great stress upon the actual food value of alcohol, because, viewed in terms of calories alone, it can almost always be readily replaced by other substances. On the other hand, there are important considerations apart from its simple energy value. It has a place as a mental sedative in periods of partial or complete starvation, and as an aid to appetite, and it makes the often one-sided diets of the diabetic more palatable.

More important still is its action upon the hyperglycæmia, glycosuria, and ketonuria of diabetes, and a large amount of work has been done on the effect of alcohol upon the amounts of sugar and ketone bodies passed in the urine. On the whole, this work has shown some diminution, both in the glycosuria and in the ketonuria, but only when moderate amounts of alcohol have been given; excessive quantities have consistently produced the reverse effect. This has especially been noted when the excessive alcohol intake has been sufficient to raise the total calorie intake above a maximum optimum level.

Allen and Wishart in two cases saw increased sugar output when moderate amounts of alcohol were added to the diet, and Joslin and Allen in America have almost abandoned its use. On the other hand, almost all workers are agreed that alcohol possesses a definite antiketogenic value (Allen and Wishart, Higgins and collaborators, Neubauer), and most continental authorities advocate its use to lessen both glycosuria and acidosis. Thus van Noorden never observed an increase, but often a fall, in glycosuria on the addition of alcohol to the diet in diabetes, and Kalz, in a study of 12 diabetics, found no disadvantage from the daily consumption of a [illegible] of strong, but as far as possible sugar-free, [illegible] Neubauer, Hirschfeld, Benedikt, and Torok [illegible] others (quoted by van Noorden) who have [illegible] shown a beneficial action upon the condition [illegible] urine after the consumption of alcohol.

Results have been less consistent when the [illegible] the blood-sugar has been examined, and [illegible] undoubtedly been partly due to variations [illegible] Allen and Wishart observed a temporary [illegible] the blood-sugar after giving alcohol [illegible] This effect in some cases was cons[illegible] prolonged luxus rations of mixed fat [illegible] to marked hyperglycæmia; Hetenyi [illegible] responses in the hyperglycæmia [illegible] grammes of alcohol (approximately [illegible] Leclercq, by giving an excessive [illegible] the diet, together with alcohol [illegible] raised the blood-sugar in two [illegible] diabetes to very high values—[illegible] to 0·319 per cent. Fuller, [illegible] noted a reduction in the hyper[illegible] in amounts from 5 to 30 c.cm. [illegible] for part of the fat in the di[illegible] simple addition to it.

Large amounts of alcohol [illegible] toxic action upon the [illegible] Albertoni's experiments [illegible] heavy administration of [illegible]



the alimentary hyperglycæmia after 100 g. of glucose much more marked than in the normal animal after a similar dose of sugar. If this action is avoided, the effect, if any, appears to be rather to reduce than to raise the blood-sugar, a change which Gavrila and Sparchey found more marked in the diabetic than in the normal; giving 0·4 g. of absolute alcohol (well diluted) per kilogramme of body-weight, and using plain water as a control, they recorded a fall in blood-sugar, half an hour after the alcohol ingestion, as great as 75 per cent. of the fasting value in some of the six diabetics whom they examined. Such an insulin-like action, if confirmed, is clearly of considerable importance, and, if constant, must obviously be taken into account in the consideration of some of the experimental results obtained by the use of insulin substitutes given by the mouth in alcoholic solution. Thus Blatherwick and collaborators found that insulin given in dilute alcohol per os caused a 30 per cent. reduction of the blood-sugar, and many plant extracts advocated in diabetes as possessing insulin-like activity are, in fact, given in strong alcoholic solution. It is significant that the blood-sugar sinking substances extractable from almost all vegetable cells have mainly been prepared from alcoholic solution, as have many of the similar substances obtained from animal tissues.

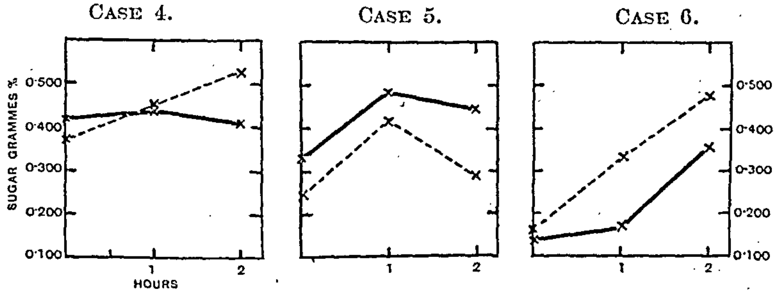
Experimental Results.

It seemed therefore worth while to study this question again in a number of diabetic patients, especially from the point of view of the action of alcohol, in a form most commonly ordered, upon the fasting blood-sugar. No detailed examination was made into the action upon glycosuria or ketonuria, since our knowledge on these points is full, and for the most part unanimous. The patients examined were all at rest in bed in the Medical Unit Wards of St. Mary's Hospital, and I am greatly indebted to Prof. F. S. Langmead, director of the unit, for permission to carry out these investigations. The procedure employed was as follows:—

The fasting blood-sugar was examined at 10 A.M.—no previous food or drink having been taken since 8 P.M. the night before—and again at 11 A.M., after which a dose of brandy, either a half or one ounce according to age, was immediately given in 4 ounces of water. The blood-sugar was then re-examined one hour and two hours later—i.e., at 12 noon and 1 P.M. Two estimations of the fasting level were made in order to detect any unsuspected tendency of the blood-sugar to fall, an inconstancy which, however, after a sufficiently long fast, is, in my experience, unusual.

Seyderhelm and Oestreich find that the blood-sugar in diabetes shows the highest value in the morning, and tends, in the majority of cases, to fall gradually during the day, but Nielson, studying the fasting level at frequent intervals, did not observe the variations or "pulsation waves" described by others. I have failed to observe changes, outside the limit of error of the method employed, on repeated examination during the same day. It may, I think, be accepted that there is no inherent tendency of the true fasting level to fall, at least in the course of a few hours. The estimations of the blood-sugar were carried out by Calvert's modified MacLean's method, the limit of error being in my hands not greater than 10 mg., except in cases showing exceptionally high values. In most cases duplicate estimations were performed, the mean value being taken when these two differed.

The results are recorded in Table I. It will be seen that in every case a fall took place, the lowest being of 32 mg., the highest of 122 mg.; this fall occurred mainly at the end of one hour, though in a few cases it was most marked at two hours. The average extent of the drop in the ten cases was 58 mg. The brandy used contained approximately 40 per cent. of alcohol by volume, so that the amount of alcohol given in one ounce was approximately 14 c.cm., with a caloric value of 98, or roughly the equivalent of 25 g. of carbohydrate.



Charts showing blood-sugar curves, in six cases, following ingestion of 50 g. glucose (continuous lines) and 50 g. glucose plus 1 oz. brandy (interrupted lines).

In order to determine if possible whether this fall in blood-sugar was brought about by a direct action of the alcohol upon the gastric or duodenal mucous membrane or was the result of its action after absorption into the blood stream, a similar dose of brandy was given with similar precautions by the rectal route. In two control cases of diabetes a rectal wash-out, followed by the injection of 4 oz. of water, caused no appreciable change in the level of the fasting blood-sugar. The results in three patients given 1 oz. of brandy in 4 oz. of water are shown in Table II. It will be seen that the fall produced is very similar to that observed when the drug was given by mouth.

TABLE I.—*The Effect of Brandy by Mouth upon the Blood-sugar in Diabetes Mellitus.*

No.	Sex and age.	Fasting level. (1)	Fasting level. (2) (1 hour later.)	Dose of brandy in ounces.	Blood-sugar— First hour.	Blood-sugar— Second hour.	Blood-sugar— Fall (max.) mg.
1	F., 65	0·181	0·181	1	0·142	0·127	— 54
2	F., 64	0·340	0·340	1	0·330	0·252	— 88
3	F., 9	0·255	0·248	½	0·218	0·216	— 32
4	F., 51	0·155	0·153	1	0·104	0·097	— 56
5	M., 8	0·397	0·395	½	0·324	0·377	— 71
6	F., 46	0·130	0·127	1	0·097	0·088	— 39
7	M., 9	0·390	0·396	½	0·274	0·306	—122
8	F., 28	0·217	0·220	1	0·184	0·223	— 36
9	M., 54	0·140	0·140	1	0·089	0·100	— 51
10	F., 46	0·410	0·409	1	0·375	0·379	— 34

Blood-sugar in grammes per 100 c.cm. blood.
Average fall 58 mg.

It may thus be inferred—though three cases only were examined—that alcohol is not only absorbed from the rectum (as is well known) but that it exercises comparable effects upon the blood-sugar by this route to those following its ingestion by mouth.

Alcohol Plus Food.

Six patients were examined with the object of determining whether this hypoglycæmic action of brandy in diabetics could also be observed when it was given together with carbohydrate in the form of the customary sugar tolerance test; it was hoped in this way to obtain insight into its effect when given with food. For this purpose 50·0 g. of glucose and 1 oz. of brandy in 4 oz. of water were given, and blood-sugar estimations were made at intervals of one and two hours. The test was repeated after an interval of not less than two days, using the same dose of glucose but omitting the brandy. For many reasons such procedures are open to certain errors, and few definite conclusions can be drawn from the curves obtained. Thus it is important to allow an interval of time between the two tests, since administration of 50·0 g. of sugar to a diabetic may seriously affect his carbohydrate tolerance for at least 24 to 48 hours; moreover, intervening diet may undoubtedly influence the shape of the curve.

TABLE II.—*Alcohol Administered Per Rectum.*

No.	Sex.	Fasting.	Fasting 1 hour later.	Dose of brandy in ounces.	First hour.	Second hour.	Fall. mg.
1	M.	0·170	0·165	1	0·126	0·102	—63
2	F.	0·154	0·168	1	0·123	0·102	—59
3	M.	0·366	0·370	1	0·342	0·330	—33

TABLE III.—*Blood-sugar Curves in Diabetes, with and without the Addition of 1 oz. Brandy, following Administration of 50 g. Glucose.*

No.		Fasting.	1 hour.	1½ hours.	2 hours.	3 hours.
1	A	0·241	0·377	0·476	0·542	—
	B	0·251	0·460	0·526	0·492	—
2	A	0·151	0·255	—	0·332	—
	B	0·171	0·316	—	0·316	—
3	A	0·292	0·380	—	0·475	0·400
	B	0·285	0·420	—	0·451	0·380
4	A	0·418	0·437	—	0·410	—
	B	0·369	0·445	—	0·520	—
5	A	0·330	0·484	—	0·444	—
	B	0·241	0·418	—	0·287	—
6	A	0·136	0·166	—	0·356	—
	B	0·154	0·330	—	0·475	—

A = 50 grammes glucose, ℥iv. water. B = 50 grammes glucose, ℥iv. water, and ℥i. brandy. Blood-sugar in grammes per 100 c.cm. blood.

There is often an appreciable change in the sugar curve when it is examined on successive occasions, and it is known to vary rapidly with alterations in the carbohydrate content of the previous diet. In these cases the alcohol-sugar-test was first carried out, and after an interval of two to five days (in four cases three days, one case five days, and one case two days) the simple sugar test was performed. The curves of the six cases are here illustrated, and the blood-sugar values are shown in Table III. As will be seen no great variations are observed, and the only constant feature noticeable is that in all the patients a more rapid rise of blood-sugar occurred when the alcohol was given with the glucose than when the latter was given alone. Thus in all cases the increase in blood-sugar at the end of one hour was greater in the former than in the latter, the mean value of this excess rise (above that shown with the glucose alone) in the six cases being 65 mg. The maximal level reached was slightly higher with glucose alone than with glucose plus brandy in four cases; in one case the latter was considerably higher, and in one appreciably so. Although the curves obtained are by no means strictly comparable, yet the alcohol curve shows a sharper and more rapid rise, while the actual height reached is but little affected; in five of the six cases the rise during the second hour was greater with the glucose alone than with the glucose and brandy together.

It may thus be concluded that the effect produced by alcohol is that of causing a more rapid absorption of sugar into the blood, and a quicker rise in the level of the blood-sugar; time is affected more than actual level. Such a result is to be expected when it is remembered how alcohol is able to aid the absorption of substances from the stomach. Edkins, giving glucose through a stomach tube to cats anæsthetised with ether, found that the rate of disappearance of the glucose from the stomach was twice as great when it was given with alcohol as when given alone. It is thus clear how such increased rapidity of absorption may lead to the changes noted in the form of the blood-sugar curve in the cases here recorded.

Conclusions and Discussion.

A "medicinal" dose of brandy is capable of lowering the fasting blood-sugar in a diabetic, and this action is brought about after absorption of the drug into the blood stream. The exact mechanism is not easily explained. It is possible that it is brought about through an action of alcohol upon the liver, by which the function of this organ in "secreting" glycogen is improved, since alcohol may be more readily burnt and more storage of sugar can take place; in other words, a true carbohydrate-sparing effect may be produced. Some work upon the alteration of the respiratory quotient after the ingestion of alcohol supports the suggestion, and this action might well account for part of the obesity frequently seen after prolonged consumption of alcoholic liquors. It is doubtful, however, to what extent, if any, alcohol can replace carbohydrate in the body. Galami, by a simultaneous study of the blood-sugar and alcohol curves in the blood after ingestion of sucrose and alcohol, found that the two curves ran independently, and that alcohol was not used directly in muscular contraction—i.e., no replacement of carbohydrate by the alcohol took place. Another possible mode of action is that alcohol might directly excite the islet tissue, perhaps through a reflex increase of blood-supply resulting from vasodilatation of the vessels supplying these cells. Alcohol has a powerful stimulant effect on gastric secretion not solely due to its local action upon the mucous membrane. Steinitz and Schereschewsky found that 300 c.cm. of 5 per cent. alcohol given per rectum caused a rapid and copious secretion of gastric juice, the maximum flow occurring in 15 to 30 minutes; glucose, water, saline, and other solutions similarly administered had no such effect. There is, moreover, some evidence (Gley and Hazard) suggesting that the entrance of hydrochloric acid into the duodenum may provoke some secretion of insulin into the blood; it undoubtedly increases the output of external pancreatic secretion.

Thus alcohol, through its stimulant action upon gastric secretion and an increased production of "secretin" and of pancreatic secretion, might in this way provoke a moderate output of insulin itself. Zunz and La Barre, Novoa Santos, and others have shown a relationship between duodenal secretion and insulin production, and Onodera records marked lowering of the blood-sugar by the action of salts upon the duodenal mucosa. Whatever the precise explanation it is certain that alcohol has no specific individual action upon islet tissue, nor is the action in lowering blood-sugar in diabetes confined to alcohol alone, since many other substances possess a similar property. At the same time brandy is a readily available drug, and its associated actions may at times make it a particularly valuable one in therapeutics. In diabetic coma it would seem to be of value, either by mouth or per rectum; moderate amounts as an addition to, or substitute for, part of the diabetic diet appear to have no detrimental influence upon the hyperglycæmia. Given with sugar it increases the rate of absorption from the stomach, but does not necessarily cause a higher concentration of glucose in the blood than is produced when sugar is given alone. Its value in non-diabetic conditions, when increase in nutrition is desired, has some support from this conclusion.

My thanks are due to Prof. Langmead, Director of the Medical Unit of St. Mary's Hospital, for his kindness in giving me facilities for carrying out these tests.

References.

Albertoni, P.: Policlinico Sez. Med., 1926, xxxiii., 225.
Allen, F. M., and Wishart, M. B.: Jour. Metab. Res., 1922, i., 281.
Benedikt, H., and Torok, B.: Zeit. f. Klin. Med., 1906, lx., 329.
Blatherwick, N., Maxwell, L., and Long, M.: Amer. Jour. Phys., 1924, lxiv., 346.
Calvert, E. G. B.: Vide Recent Advances in Medicine, G. Beaumont and E. Dodds, 2nd ed., London, 1925; Orig. in Biochem. Jour., 1924, xviii., 839.
Edkins, N.: Jour. of Phys., 1928, lxv., 381.
Fuller, L. S.: Jour. Metab. Res., 1922, i., 609.
Galami, A.: Bull. Soc. Ital. biol. sper., 1927, ii., 972.
Gavrila, J., and Sparchey, T.: Comptes rend. Soc. biol., 1928, xcviii., 65.
Gley, E., and Hazard, R.: Ibid., xcix., 195.
Hetenyi, G.: Zeit. f. d. ges. Exp. Med., 1924, xl., 261.
Higgins, H., Peabody, F., and Fitz, R.: Jour. Metab. Res., 1916, xxxiv., 263.
Joslin, E. P.: The Treatment of Diabetes Mellitus, 3rd ed., London, 1924, p. 465 et seq.
Leclercq, F. S.: Jour. Metab. Res., 1922, i., 307.
Neubauer, O.: Münch. Med. Woch., 1906, liii., 791.
Nielson, O. J.: Rev. in Centralbl. f. d. ges. Inn. Med., 1928, li., 841.
Noorden, Carl van: Die Zuckerkrankheit und Ihre Behandlung., Berlin, 1927.
Onodera, N.: Rev. in Kongress Centralbl. f. d. ges. Inn. Med., 1928, li., 683.
Santos, Novoa R.,: Endocrinology, 1928, xii., 199.
Seyderhelm, C., and Oestreich, C.: Zeit. f. Klin. Med., 1928, cix., 35.
Steinitz, H., and Schereschewsky, R.: Arch. f. Verdauungskr., 1928, xlii., 521.
Sammartino, U.: Centralbl. f. d. ges. Inn. Med., 1928, xlii., 742.
Zunz, E., and La Barre, J.: Comptes rend. Soc. biol., 1928, xcix., 335.

SPINAL ANÆSTHESIA.

A CRITICISM OF THE PITKIN METHOD.

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AT the Manchester meeting of the British Medical Association last year, Dr. F. A. Kelly, of Detroit, U.S.A., speaking of the method of anæsthesia recommended by Dr. George Pitkin, of New Jersey, said that "Dr. Pitkin . . . has worked out a technique which to my mind does away with the objections to the older methods of spinal anæsthesia. The main objections in the past have been, first, the transitory nature of the anæsthesia; secondly, lack of control of the height or extent of the anæsthesia; thirdly, the serious depression of the blood pressure. The technique devised and advocated by Dr. Pitkin . . . completely negatives all of the above objections and with them other objections that one so often hears."[1]

Dr. Kelly, who demonstrated the Pitkin method in August, 1928, injected a fluid lighter than the cerebro-spinal fluid and containing 100 mg. of novocain per c.cm.; 1·1 mg. of strychnine and 14½ per cent. alcohol made up to 2 c.cm. with normal saline. The fluid also contained a body derived from starch and called "gliadin" or "amyloprolamin." He mixed this fluid with more or less cerebro-spinal fluid as required, and having injected it he tilted the table to direct the injection to the particular region he wished to influence. None of these procedures is new. It is possible that "gliadin" is new in this connexion, and though novocain and alcohol have both been used before as constituents of an intrathecal injection they may not have been used in combination. It is certainly a most valuable combination, and if Dr. Pitkin is responsible for this he has made a notable contribution to the practice of spinal anæsthesia. The function of gliadin seems to be to hold the injected solution together "as an air bubble on a spirit level" and to delay the absorption of the novocain so that toxicity is reduced and anæsthesia prolonged. By this means Dr. Pitkin is able to give much larger doses than have hitherto been given—up to 400 mg. or even more if necessary.

FIG. 1.

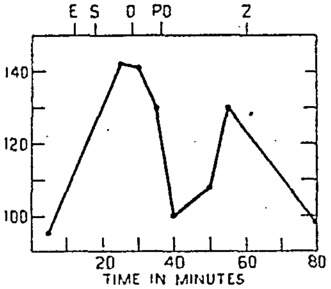

Chart showing blood pressure during operation. E = Ephedrine, 5 per cent.; novocain, 1 per cent. 1 c.cm. S = Spinocain, 2 c.cm. O = Operation begun. P.O. = Peritoneum opened. Z = Operation finished. The blood pressure before operation was 94 mm. and it remained above this level during the operation which was a complete abdominal exploration. After 45 mins. (i.e., 5 mins. after the operation was finished) *the anæsthesia as tested by* towel forceps was above the clavicles.

Dr. Pitkin states that "if the anæsthetic fluid is confined to the lumbar spine there is no change in the blood pressure; if it reaches the first thoracic the pressure becomes nil."[1] The record of blood pressure given in Fig. 1 shows that, at any rate in this dogmatic form, this statement cannot be accepted. The blood pressure usually falls below the normal in a complete laparotomy with the anæsthesia extending above the clavicle, but in this case it did not. Dr. Pitkin regards a large fall of blood pressure as one of the objections to the older methods of spinal anæsthesia. Figs. 2 and 3 show blood pressure records taken from patients anæsthetised by the Pitkin method; they were both desperate surgical risks and both made excellent recoveries, in part due to the protection afforded by the spinal anæsthesia. The technique, however, did not prevent a fall in blood pressure.

Are we to conclude that a fall of pressure does not matter or that some falls do matter and others do not? If, at the end of a long surgical operation with much visceral manipulation, shock or hæmorrhage, the blood pressure falls steadily, progressively and extensively, then indeed the fall is the index and measure of the gravity of the situation. If, on the other hand, a fall is produced by injecting half a dozen grains or so of novocain into the spinal theca and paralysing a vaso-constrictor or two, the fall should be regarded as an indication of the amount of vaso-dilatation, and the need for some degree of the Trendelenburg position, but not as a sign that the situation has developed into one of unexpected gravity. The fear of a fall of blood pressure is a relic of a different technique in which the anæsthetic solution was heavier than the cerebro-spinal fluid and was not fixed. The patient had to sit up, the Trendelenburg position was not available, and a dangerous anæmia of the medullary centres might appear.

The Pitkin method is valuable, therefore, not because it completely negatives a large fall of blood pressure, but because in the circumstances of a modern operation a large fall of blood pressure is not greatly to be feared. The passing danger of anæmia of the medulla is overcome by the Trendelenburg position and the heart, accustomed to work against a pressure of 200 mm. of mercury, finds itself relieved of three-quarters of its burden, presumably to its advantage.

In these cases of high blood pressure the pressure is doubtless a response to some subtle need of the organism, but the subsequent histories of my cases do not suggest that the need is so imperious that it can suffer no remission, while the surgeon removes its cause, or a large factor of its cause. When the anæsthesia reaches as high as or higher than the second dorsal, why is it that we find sometimes a big fall in blood pressure, at other times little or none? It may be possible to anæsthetise the posterior roots and not the anterior, and as the vaso-constrictor fibres pass out by the anterior roots through the white rami communicantes to join the splanchnics, they may possibly escape the action of the novocain. The last word has not been said on this question and the time for dogmatic statement is not yet.

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[1] Brit. Med. Jour., 1929, ii., 187; see also THE LANCET, 1929, ii., 825.

Strychnine.

Dr. Pitkin says: "We conducted a series of tests and animal experiments with all the drugs that have been advocated as vaso-constrictors. Strychnine, intradurally, was the only one that showed satisfactory results in the presence of novocain."[1] So far as I know, he has published no experiments in support of this statement. With reference to the effects of therapeutic doses of strychnine on the blood pressure Sollmann says: "These effects are so inconstant and small that they could be accidental."[2] When strychnine has been applied to the cord direct there is no mention of a rise of blood pressure. The case for the rise of blood pressure is not proven. The great characteristic action of strychnine is to break down the internal resistance of the spinal cord so that a definite stimulus produces a bigger motor response than in normal conditions. This leads to the early onset of rigidity and puts the patient into a state diametrically opposite to the one desired by the anæsthetist, who wants a smaller response to a given stimulus. He wants the passage from one side of the reflex arc to the other made more difficult, and the internal resistance of the spinal cord increased. On theoretical grounds, then, strychnine would seem to be contra-indicated. Clinically, it is interesting to note that Jonnesco,[3] who has had a longer experience of spinal anæsthesia than anyone in Europe, has given up intrathecal strychnine after 15 years' trial. Both adrenalin and ephedrine will raise the blood pressure, even after destruction of the splanchnic nerves, so that there seems no object in using a drug like strychnine for this purpose. The reasons against it are overwhelming; they are: (1) there is little reason for supposing that we require to raise the blood pressure; (2) there is no convincing evidence that strychnine will raise it; (3) other drugs will; and (4) strychnine produces a state exactly opposite to the one desired.

FIG. 2.

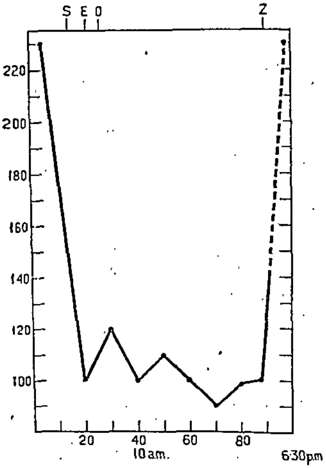

Chart of blood pressure during operation on a woman, aged 63, with a fistula between gall-bladder and duodenum. The gall-bladder was excised and the duodenum stitched up, the operation lasting 50 minutes. S = 2 c.cm. spinocain. E = 1 c.cm. ephedrine, 5 per cent.; novocain, 1 per cent.. O = Operation begun. Z = Operation finished. During operation the blood pressure fell from 230 to 90 mm. Hg. A few hours later it had fully recovered.

FIG. 3.

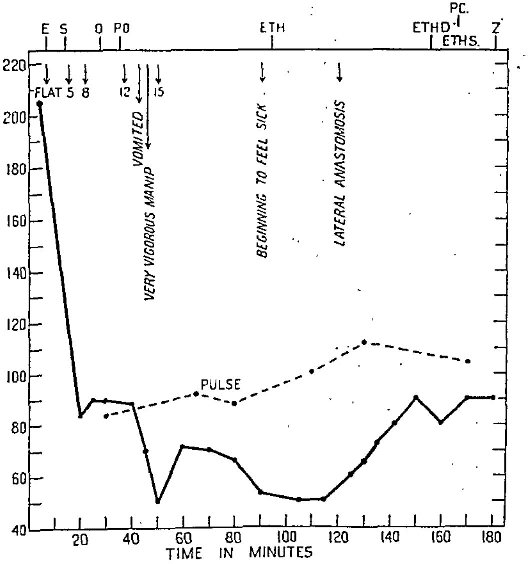

Chart showing blood pressure of a male, aged 65, during resection of growth of colon. E = Ephedrine, 5 per cent.; novocain, 1 per cent. 1 c.cm. S = Spinocain, 2 c.cm. O = Operation begun. P.O. = Peritoneum opened. ETH. = Ether. ETH.D. = Ether deepened for stitching peritoneum. P.C. = Peritoneum closed. ETH.S. = Ether stopped. Z = Operation finished. Flat 5, 8, 12, and 15 = degree of slant of table, head down. The chart shows a fall of blood pressure from 205 mm. Hg to 50 mm. Hg. It also shows a slow steady rise, presumably due to the gradual absorption of the spinocain. The pulse-rate was 104 at end of operation lasting 2 hours 32 mins. Patient made a good recovery.

Messrs. May and Baker have kindly made for me a solution resembling spinocain but containing no strychnine, and it has given clinical results in no way inferior to those of spinocain. Whereas the two biggest falls of blood pressure (Figs. 2 and 3) I have seen occurred in patients who were anæsthetised with spinocain, the longest anæsthesia I have seen, in which there was complete muscular relaxation and absence of pain for one and three-quarter hours, was done under this strychnine-free preparation.

Controllability.

Under this heading come the three factors of height, duration, and intensity. Almost anything may result from extracting 2 c.cm. of cerebro-spinal fluid from the theca between the third and fourth lumbar vertebræ and reinjecting it mixed with 2 c.cm. of spinocain; there may be anæsthesia extending downwards from an inch below the nipple line, or only from an inch below the umbilicus, the patient being in the Trendelenburg position 5°. If expansion is essential for a high anæsthesia, how is it that a high and long anæsthesia is produced when only 2 c.cm. of cerebro-spinal fluid have been extracted? It is not very rare to be able to do a laparotomy under these conditions.

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[2] Sollmann, T.: Manual of Pharmacology, 3rd ed., Phil., p. 254.

[3] Jonnesco, T: Presse. Méd., 1926, xxxiv., 145.

Duration again is a variable quantity. One hour is generally available for laparotomies after the administration of 2 c.cm. of spinocain. The longest time I have ever seen was one and three-quarter hours, but this was after the injection of 3 c.cm. of the strychnine-free preparation made for me by Messrs. May and Baker; pain and rigidity were completely in abeyance for the whole of this time. When the anæsthesia passes off it does so by the oncoming of pain or rigidity. As the case whose blood pressure record is shown in Fig. 5 illustrates a number of these points, I shall describe it in detail.

The patient was a strong, muscular young man of 28. He had had more than one hæmorrhage from the bowel, and a provisional diagnosis of duodenal ulcer had been made. In view of a probable gastro-enterostomy, a high anæsthesia was required, and 3 c.cm. of spinocain were mixed with 5 c.cm. of cerebro-spinal fluid and injected into the theca between the first and second lumbar vertebræ. The anæsthesia and the muscular relaxation were good On opening the abdomen a diseased Meckel's diverticulum was found; this was removed, as was also the appendix. The surgeon then turned to me and said "You must give him some ether." I said "What for? He's not feeling anything." This was confirmed by the patient. However, the abdominal walls were too rigid to proceed without ether. This conversation took place one hour and two minutes after the injection of spinocain. The assistant surgeon, who had come 40 minutes late, said that he had noticed that the muscles had been getting more and more rigid ever since his arrival—that is to say, 20 minutes before the surgeon asked for ether, up to which time the patient had felt no pain. The path of pain to the brain was blocked, but the spinal reflex was not. No root anæsthesia could account for this. The spinal cord was blocked high up, but free lower down.

This means that the novocain is high in the dorsal region, where it is not only anæsthetising the roots of the nerves but the cord as well, and so preventing pain. The spinothalamic tract, the path of pain, is blocked. The original muscular relaxation (abdominal) must have been due to a portion of the spinocain left behind by the main mass during its ascent to the higher dorsal region, but these trailing clouds have been absorbed leaving the lower cord free and—thanks to the strychnine—in a highly excited condition, thus accounting for the rigidity.

The evidence from this case, then, tends to show: (1) That the anæsthetic affects the cord (spinothalamic tract), as well as the posterior roots. (2) That the spinocain does not remain en masse. (3) That strychnine is contra-indicated. (4) That the commonly accepted idea that the anæsthesia passes off from above downwards is that particularly dangerous form of fallacy, a half-truth; it does pass off from above downwards, but equally from below upwards. (5) That in those cases in which it is only possible to extract 1 or 2 c.cm. of cerebro-spinal fluid, the anæsthesia required for a laparotomy can be attained if the resulting 3 or 4 c.cm. of mixture can be placed in contact with the cord in the region of the sixth, seventh, eighth, ninth, and tenth posterior dorsal roots. I have records of such cases.

C. A. Pannett[4] has shown that the dural sac is inextensible, and tends to assume the form of a cylinder. A semi-mucilaginous fluid injection which remains en masse should assume the form of a cylinder too, its length depending upon its bulk. Assuming that this anæsthetic solution is absorbed at the same rate all along the line—a reasonable assumption—the anæsthesia should pass off all along the line, at the moment when the concentration of novocain in the solution becomes a sub-anæsthetic concentration. It is doubtful if this ever happens in practice, but there is definite evidence that anæsthesia no longer exists at an area where, a few minutes before, it had existed, coupled with the existence of anæsthesia, both then and now, in a neighbouring segment. A case will illustrate my meaning.

A fistula in ano came to operation on July 12th last. Two cubic centimetres of spinocain were mixed with one cubic centimetre of cerebro-spinal fluid and injected, the patient being in a 5° Trendelenburg position. The operation lasted 25 minutes and was painless. The last step of the operation was the insertion of two stitches, which was painful. The patient winced at each prick of the needle, and remarked that the numbness was passing off. I pinched the skin over both calves immediately after, and again 5, 10, and 15 minutes later, and he could feel nothing, and said: "It's no use, I can't feel anything below the knees." Here, then, the fifth sacral and coccygeal nerves had been anæsthetised, but the anæsthesia had passed off while the fifth lumbar and first and second sacral segments were still anæsthetised. The anæsthetic area had contracted, but had not been extinguished all along the line at the same time.

FIG. 4.

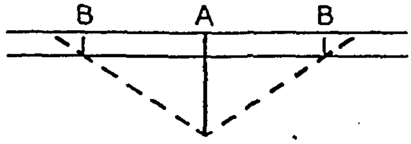

Diagram to illustrate the absorption of spinocain from the theca. The areas supplied by region (A) of the cord and its roots will be under the influence of spinocain longer than the areas supplied by regions at (B).

The shape of the injected solution, supposing the bulk of it to remain en masse, must be roughly triangular or semi-hemispherical (Fig. 4). The deepest part of the solution will be at the point of injection (or where the solution settles itself), becoming less deep on either side; the depth of anæsthesia will correspond to the depth of the solution.

Criticism of Dr. Kelly's Statement.

With a high dorsal anæsthesia the change in blood pressure may vary from a fall of 154 mm. of mercury to an actual rise above the preoperative reading; with the same dose, the same mixture, and the same slant of the table there may be a variation of four spinal segments—sixth to tenth dorsal—in space, and nearly 100 per cent. (35–85 minutes) in time. This is controllability, perhaps, but limited controllability.

Dr. Kelly mentions the presence of active peristalsis during spinal anæsthesia, but, as Dr. A. L. Flemming pointed out at the meeting, this is also observed when the patient is under a general anæsthetic. In the light of recent work by M'Crea and Macdonald[5] of Manchester University, the old theory of the vagus being the excitor and the splanchnic the inhibitory nerve of the stomach is no longer entirely tenable. It is probable, then, that Dr. Kelly's explanation—that the increased peristalsis is due to paralysis of the "vasomotor nerves (the source of intestinal inhibition)"—is more in accordance with an old theory than with new truth.

If, then, the Pitkin method gives little control over the duration of the anæsthesia, less over its height, and practically none over the blood pressure, and if Dr. Kelly's explanation of the increased peristalsis is at variance with the results of modern research into the function of the splanchnics, in what does the excellence of the method consist? Insufficient experience of other methods and of the limits to which the Pitkin method can be pushed make me diffident of too great a dogmatism. However, I would suggest that safety is its primary virtue. In novocain we have a drug that is almost if not quite ideal. Stovaine is admittedly more toxic than novocain, but it causes greater muscular relaxation. The muscular relaxation given by novocain is obviously not that of curare. In a high abdominal operation it is usual to cause some discomfort on manipulation of the stomach, and this is commonly attributed to dragging on the peritoneum on the under surface of the

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[4] Pannett, C. A.: THE LANCET, 1929, i., 271.

[5] M'Crea, E. D., and Macdonald, A. D.: Quart. Jour. Exper. Physiol., 1928, xix., 161.

diaphragm or to vagal stimulation. This is thought to be unavoidable because if the anæsthetic went high enough to anæsthetise the third and fourth cervical segments it would paralyse the diaphragm. I doubt this. First, Pavlov has shown that the "motor area" in the brain is primarily a receptor rather than an executor area, and there may be an analogous mechanism in the cord. Secondly, in a very high anæsthesia, up to and even beyond the first dorsal, there is no clinical evidence of interference with the intercostal muscles. Presumably the relaxation of the abdominal muscles under novocain is due to a paralysis of the receptor mechanism, and, even if this paralysis extended to the third and fourth cervical, the diaphragm would still receive innervation from the unparalysed respiratory centre and exercise its still unparalysed motor mechanism. In other words, novocain is a drug that paralyses receptors only. This would be as fatal to the diaphragm as to the abdominal muscles were it not for the alternative stimulus for the diaphragm from the respiratory centre. It is somewhat like an engine with dual ignition; when the battery fails it will run on the magneto.

The next point in favour of the Pitkin method is the use of a colloid which tends to hold the solution together and delays absorption of the drug. This reduces toxicity and, allowing the use of larger doses, prolongs the duration of the anæsthesia. There is no evidence to show that "gliadin," whatever it may be, is any better than dextrin. Dr. Pitkin is too much of a purist to admit that there is any virtue in chloroform, but I have found that a mixture of the two methods can be made to combine the advantages of each without the drawbacks of either (Fig. 5).

The measure of success achieved with spinal anæsthesia depends on the trained intelligent coöperation of those surrounding the patient. A nurse who tells her patient that nothing would induce her to have a spinal anæsthetic goes some way towards inducing a wrong state of mind which makes all subsequent procedures more difficult. Conversation, however necessary it may be, if conducted in whispers is apt to give rise to the impression that some sort of conspiracy is afoot. The surgeon and the doctor in attendance should trust the anæsthetist, whose job it is to keep in intimate touch with the patient in order to be aware of the exact state of his feelings. It is the surgeon's part to get on with the operation and glean such information as he may require from the anæsthetist and not from the patient. In testing for the height of anæsthesia a surgeon should not clip the skin with towel forceps and say "Does that hurt you?" It is rude to the anæsthetist and disturbing to the patient; it is apt to shake his confidence, and he will argue that these people do not know whether they are hurting him or not so he had better let them know in time. Another thing patients resent—two of them have used the word "insulting" when referring to it—is the placing of instruments on their undefended chests. No one but an anæsthetist, whose hand frequently wards off some of this steady rain of blows, knows how exactly the adjective describes the offence.

FIG. 5.

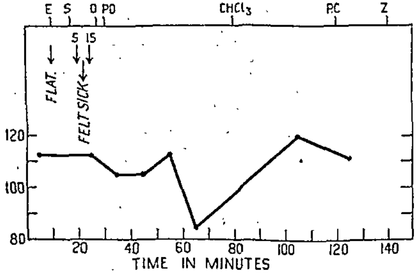

Chart of blood pressure in case described in text. E. = 2 c.cm. ephedrine, 5 per cent.; novocain, 1 per cent. S = 3 c.cm. spinocain. O = Operation begun. P.O. = Peritoneum opened. P.C. = Peritoneum closed. Z. = Operation finished. Flat 5 and 15 = degree of slant of table with head down.

Whatever success we may have achieved with spinal anæsthesia has been due to the coöperation of all concerned. The development of a new technique calls for the exhibition of many desirable qualities and they have been forthcoming. The enthusiasm of Mr. A. H. Burgess, the interest of Mr. W. H. Hey, and their patience, coupled with the loyalty of their nursing staffs, have been indispensable and inestimable.

THE IRRADIATION OF MILK

FOR THE INCREASING OF ITS ANTIRACHITIC POTENCY.

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With a Description of a Method of Irradiation Devised by J. O. HICKMAN.

IT has been known for some years that the antirachitic potency of milk could be greatly increased by irradiation from a quartz mercury-vapour lamp (Steenbock and Daniells,[1] 1925), but it soon became evident that such treatment, while beneficial from the standpoint of the vitamin D content, could be extremely harmful from the standpoint of the vitamin A content (Titus,[2] &c., 1926, and Drummond,[3] 1927). The treatment which resulted in the destruction of vitamin A appears, however, to have been unnecessarily prolonged, for later work by Supplee and Dow[4] (1927) claims that an exposure of milk in thin films to a Hanovia lamp for a few seconds or not more than one minute about doubles the antirachitic value of the milk, and apparently does not destroy the vitamin A.

Earlier investigations showed that a prolonged exposure imparted to the milk a disagreeable odour and taste, and one of us (J. O. H.) has found that any time longer than eight minutes turns the milk putrid; a series of tests has shown that a slight change in flavour could not infrequently be detected after an exposure of 30 seconds, which became more marked with every lengthening of the exposure till the change to putridity after eight minutes.

The present paper gives the results of short-time exposure of milk (both whole and skimmed) to ultraviolet light under conditions which have definitely increased the antirachitic potency without apparently decreasing the vitamin A content of the milk or appreciably affecting its taste. The irradiation of the milk was carried out daily by a method devised by one of us (J. O. H.). The milk was run over a 21 in. by 22 in. milk cooler at the rate of a gallon in 15 minutes. It was allowed to run for a few minutes before the lamp was brought to work on it, during which time the film was spread evenly over the whole surface with a spoon. Once spread the film should not break. The lamp used was of the Hanovia type. It was run at 200 volts, 2 ampères, and allowed to burn for several minutes before it was allowed to play on the milk. It was hung at a distance of 12 in. from the middle of the film of milk, and a specially designed reflector to focus the rays upon the surface to be treated was employed. It may be estimated that a particle of milk would be, on an average, 30 seconds on the cooler, but for a great part of this time it would be on the horizontal parts of the cooler, and thus scarcely affected by the rays from the lamp. No special efforts were made to produce a current of air between the lamp and the film of milk. For the purpose of the fourth experiment the rate of flow of the milk was accelerated so that the time of exposure was reduced to about 15 seconds and two gallons passed over the cooler in 15 minutes. The sample of untreated milk was taken from the bucket of milk which was afterwards treated, so that the two samples "treated" and "untreated" were identical except for the irradiation.

It was felt to be of the highest importance that no treatment of milk should be recommended if there were the slightest danger of any reduction in its vitamin A activity. Accordingly a rigorous test of the vitamin A content of the milk before and after the irradiation was carried out by the method described by Steenbock and Coward[5] (1927).

Experimental Work.

Controlled tests of the vitamin content of the irradiated milk have been made for us on rats, with the following results:—

Vitamin A.—Varying quantities, 0·5, 1 and 2 c.cm., of the untreated and of the irradiated milk was given each to three or four rats. The growth response of the rats was graded to the dose in each case, and there was no appreciable difference between the growth response of the rats given untreated or irradiated milk; therefore it appeared that the vitamin A content of the milk was unaffected.

Vitamin D.—As to the vitamin D content of the milk irradiated, five tests were carried out between August, 1928, and June, 1929; in each the rats were given the high-calcium, low-phosphorus diet of Steenbock and Black[6] (1925) for a preparatory period of three weeks; thereafter some rats in each litter were given a preparation of irradiated ergosterol, some untreated milk and some irradiated milk, in each case for a period of ten days; the degree of healing engendered in the rachitic rats was estimated by the "line" test.

Expt. 1 (August, 1928).—To compare the effects of untreated milk, irradiated milk, and irradiated ergosterol. The irradiated milk was found to contain 0·13 to 0·2 unit of antirachitic activity per c.cm., or more than five times that of the untreated milk.

Expt. 2 (November, 1928).—To compare the effects of untreated milk, milk irradiated once and twice, and irradiated ergosterol. The once irradiated milk contained 0·5 unit of antirachitic activity, and the twice irradiated about double this or one unit: the antirachitic activity in the untreated milk was negligible.

Expt. 3 (February, 1929).—To determine whether skimmed milk could be given antirachitic properties by irradiation. The severity of the rickets in the rats used for this test was distinctly less than in the previous tests, but it showed that the untreated skimmed milk had no antirachitic activity, but the irradiation of this milk produced appreciable antirachitic activity in it. In all the above experiments the time of exposure of the milk was 30 seconds.

Expt. 4 (February, 1929).—To compare the capacity for activation of whole and skimmed milk, and to try the effect of the shorter exposure of 15 seconds only. The result showed that the vitamin D content of the untreated milk was nearly negligible, but the irradiated skimmed milk contained 0·8 unit of antirachitic activity per c.cm., and the irradiated whole milk 2 units per c.cm.

Expt. 5 (June, 1929).—To estimate the antirachitic potency of the milk of cows on the best summer feed and to try the effect of an irradiation for eight seconds only. The untreated milk contained 0·1 unit of antirachitic activity per c.cm., which the irradiation for eight seconds increased to 1 unit, an increase of no less than 900 per cent.

Results on Children.

Three examples of the use of this irradiated milk over a period of time can be given (J. O. H.).

(*a*) Boy born Oct. 2nd, 1922:

	1/1/27	1/1/28	1/1/29	2/11/29	2/12/29
Height.	3ft. 8⅝in.	3ft. 10in.	4ft. 2¼in.	4ft. 4¼in.	—
Weight.	41lb. 9oz.	44lb. 14oz.	50lb. 2oz.	57lb.	58lb. 4oz.

(*b*) Girl born Jan. 18th, 1924:

	1/1/27	1/1/28	1/1/29	2/11/29	2/12/29
Height.	3ft. 2⅜in.	3ft. 4½in.	3ft. 8¼in.	3ft. 10⅝in.	—
Weight.	32lb. 8oz.	33lb. 1oz.	37lb. 2oz.	41lb. 13oz.	42 lb.

These children had untreated milk in 1927, and from January, 1928, to date the same quality milk irradiated; the average quantity taken by the boy was 2 pints per diem, by the girl 1½ pints per diem.

(*c*) Boy born July 3rd, 1927:

	Weight.	
Aug. 2nd, 1928	20lb. 4oz.	on ordinary Grade A milk.
Sept. 2nd, ,,	20lb. 9oz.	
Oct. 2nd, ,,	21lb. 7oz.	half the month irradiated milk.
Nov. 2nd, ,,	21lb. 13oz.	on ordinary milk.
Dec. 2nd, ,,	24lb.	on irradiated milk.

Thereafter he continued on the irradiated milk to gain on the average 1 lb. 4 oz. per month for three months.

Discussion.

The increase in the weight of these children when given irradiated milk, compared with that when they were given the same milk but untreated is striking. Observations have also been made (D. N.) at the Hospital for Sick Children, Great Ormond-street, on children with severe rickets, marasmus, malnutrition, and other serious ailments, with very good results, although it is not possible to give to these observations the scientific accuracy described for the animal experiments detailed above. It was frequently found that a week or two on the irradiated milk acted as a fillip to the child, who then started to improve, after having been stationary for some time. The writer has drunk a glass of the milk daily for more than a year, and during the past winter, when on several occasions a tickling in the throat seemed to be the premonitory sign of a threatening cold, this did not materialise. Several adults who have partaken of the milk daily for many months feel themselves the better for it.

There is a further point of interest in connexion with the irradiation of milk—viz., the effect on the bacterial content. Many examinations of the bacterial content before and after irradiation have been made and invariably there has been a considerable reduction in the numbers of bacteria present after the irradiation, frequently to only one-tenth of the original numbers. It should be added, however, that this milk is amongst the most bacteria-free examined (D. N.), for rarely have there been more than a few hundred organisms per c.cm. of the untreated milk, and on no occasion have more than 4000 organisms per c.cm. been counted. This purity of the milk as regards bacteria may possibly be due in part to the practice of applying the ultra-violet rays to the udder and teats of the cow just before milking, and to the fact that all the dairy utensils are similarly treated just before use.

In a recent paper on the therapeutic value of irradiated milk in the treatment of rickets, Chalmers Watson, Finlay, and King[7] confirm earlier observations as to the value of irradiated milk in the prevention and cure of rickets, and they show that the disease is cured more quickly and economically by the use of irradiated milk than by the various irradiated preparations on the market. Their paper confirms our own observations that irradiated milk may prove of considerable value in the treatment of other disorders besides rickets. They strike a note of caution, however, which should be borne in mind when irradiated milk is being given to children—namely, that in view of its powerful effect on the growing bones, the possibility of their premature ossification must not be overlooked, and they advise that irradiated milk should not form the sole diet of infants and children, but that these should be given one part of irradiated milk to one or two parts of good, fresh milk.

More recently still Katharine Coward,[8] in an article on the value of irradiated milk compared with cod-liver oil as a source of vitamin D, draws attention to the fact that vitamin D content of irradiated milk may vary within wide limits (0·1 unit to 2 units per gramme), though with the method of irradiation we have described the usual content of the milk has been about 1 to 2 units per gramme. Dr. Coward also points out that cod-liver oil itself may vary from 50 to nearly 200 units per gramme as regards its vitamin D content.

Summary.

1. Untreated milk, both whole and skimmed, has very little antirachitic activity. The best sample examined had only 0·1 unit per c.cm., and this was taken during a time when the cows were receiving the best "summer feed." Three samples taken during the winter and one taken during drought conditions at the same farm showed such slight antirachitic potency that it might be termed negligible.

2. The antirachitic potency of the milk can be increased enormously by direct irradiation from a quartz mercury-vapour lamp. Where the potency of the untreated milk could be measured, that of the treated milk was increased nine times by an exposure of eight seconds.

3. The capacity for activation of different samples of milk varies.

4. An exposure of 30 seconds (the longest period tried in these experiments) had no detectable influence on the vitamin A potency of the milk.

5. The irradiated milk can cure as well as prevent rickets in children and animals, and is of value in other disorders of nutrition, and in other diseases.

6. Irradiation produces a marked decrease in the bacterial content of the milk.

References.

1. Steenbock H., and Daniells, Amy L.: Jour. Amer. Med. Assoc., 1925, lxxxiv, 1093.
2. Titus, Hughes, Henshaw, and Fitch: Ind. and Eng. Chem., 1926, xviii, 843.
3. Drummond, J. C.: Letter to the Times, quoted in Jour. Amer. Med. Assoc., 1927, lxxxviii., 1014.
4. Supplee, G. C., and Dow, C. D.: Jour. Biol. Chem., 1927, lxxv., 227.
5. Steenbock H., and Coward, K. H.: Ibid., 1927, lxxii., 765.
6. Steenbock, H., and Black, A.: Ibid., 1925, lxiv., 263.
7. Watson, Chalmers, Finlay, T.Y., and King, J. B.: THE LANCET, 1929, ii., 704.
8. Coward, K. H., THE LANCET, 1929, ii., 1090.

TREATMENT OF
STREPTOCOCCAL SEPTICÆMIA WITH STREPTOCOCCAL ANTITOXIN.

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Mr. Burt-White's recent paper[1] on the treatment of cases of puerperal septicæmia by scarlet fever antitoxic serum has prompted me to publish, rather prematurely, a very small number of cases of streptococcal septicæmia which have been successfully treated in this manner.

I intend to publish only the four cases in which the infection was proved by isolation of *Streptococcus hæmolyticus* from the blood, but as they were all extremely severe, and as they all made complete recovery, I think it worth placing them on record with the hope that this form of treatment may receive a more extensive trial. These cases were in no way selected and happen to be the only ones that I have had access to since the publication of the experimental work of Parish and Okell[2] in 1928. This important piece of work made it probable that antitoxin prepared from scarlet fever streptococcal toxin would be effective against hæmolytic streptococci from other sources, and they urged that "as this is the only streptococcal antibody with any acceptable and experimental credentials it should be given an extensive trial in all severe streptococcal infections, particularly in general septicæmia."

Historical.

The published results of the antitoxin treatment must necessarily be scanty at this early stage and, apart from the paper referred to above, I am only aware of the following:—

Sanderson[3] and others in 1927 successfully treated a case of puerperal septicæmia and a case of septicæmia secondary to otitis media by injecting concentrated scarlatinal streptococcal antitoxin intramuscularly. These cases were first tried with the ordinary polyvalent antistreptococcal serum, but as they did not respond to this and other remedies the scarlet fever streptococcal antitoxin was administered. The second case was thought to be beyond hope of recovery when the antitoxin treatment was commenced. Boente[4] in the same year, 1927, reported that the serum from convalescent cases of scarlet fever had a curative action in cases of erysipelas and other streptococcal infections, but no effect in cases of infection with *B. coli* or *Staphylococcus aureus*. He also showed that antiscarlatinal serum from an immunised horse was beneficial in cases of puerperal infection, acute tonsillitis, and erysipelas, and furthermore, that sera prepared against strains of streptococci isolated from cases of puerperal fever or erysipelas were beneficial in scarlet fever.

Cases.

The following is a brief description of the cases under my observation.

CASE 1. *Septicæmia following a Pricked Finger.*—On May 14th, 1928, a doctor, aged 69, pricked his thumb with an adenotome after operating on a case of tonsils and adenoids. A few days later the thumb became very painful and slightly œdematous, and an unsuccessful attempt was made to reach the pus under a local anæsthetic. The infection started to spread up the arm, and on May 21st temperature rose above normal. On the 22nd the temperature was 103° F., a general anæsthetic was administered, and Mr. E. K. Martin performed an extensive operation evacuating the pus. A blood culture taken at the time of operation gave a pure and massive growth of *Streptococcus hæmolyticus*. 15 c.cm. of scarlet fever streptococcus antitoxin (Parke, Davis and Co.) were injected intramuscularly. On the 23rd the temperature reached 103° F., and another 15 c.cm. of the same antitoxin were administered subcutaneously. On the 24th the temperature only reached 100° F., and 10 c.cm. of concentrated scarlatina streptococcus antitoxin (Burroughs, Wellcome and Co.) were administered subcutaneously. On the 25th the temperature only reached 99° F., and a blood culture taken on this date was sterile. A further 10 c.cm. of antitoxin (B. W. and Co.) were injected subcutaneously. On the 26th the temperature did not rise above 99° F. Thus for two days the temperature was practically normal, but the next day and during the following ten days it rose and fluctuated daily on the 101° F. mark. This was due to the pus pocketing, and when the pockets were opened the temperature became normal and the patient recovered. The patient's general condition was so good during the second febrile period that no further serum was given.

CASE 2. *Puerperal Septicæmia.*—A woman, aged 37, was confined on April 2nd, 1929, the child being born before arrival of the doctor. No manipulation was employed. She was quite well until the third day when the temperature rose to 101° F. and pulse-rate to 116. From this until the eighth day the temperature varied between 104·2° and 100·8° F., with a pulse-rate of 150–120. General peritonitis was suspected and a laparotomy was performed, but apart from a little serous effusion nothing was found. A blood culture was performed and *Streptococcus hæmolyticus* was isolated. When seen by Mr. C. D. Read she was in extremis, with heliotrope flush and slight toxic strabismus. 10 c.cm. of scarlatina streptococcus antitoxin (B. W. and Co.) were given intravenously at once and 10 c.cm. intramuscularly on the thirteenth and fourteenth days respectively. On the fifteenth day the temperature was 99·2° F. and pulse-rate 112, and the patient was definitely better. The serum was repeated two days later and the temperature gradually settled down and the patient made a complete recovery.

CASE 3. *Puerperal Septicæmia.*—A woman, aged 29, was confined on Sept. 1st, 1929. The confinement was normal apart from a small perineal laceration. After the confinement the temperature was about 99° F. until the fourth day when it reached 100° F. On the seventh day the temperature was 102·2° F., with a pulse-rate of 96, and a foul, blood-stained vaginal discharge; the uterus was not involuted. On Sept. 8th the uterus was evacuated and a cotyledon of placenta was removed. As a result of this the temperature showed slight improvement but soon rose to the 103° F. and 104° F. mark, and signs of general septicæmia appeared. *Streptococcus hæmolyticus* was isolated

A CASE OF
LANDRY'S PARALYSIS OF DESCENDING TYPE.

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With Pathological Note by

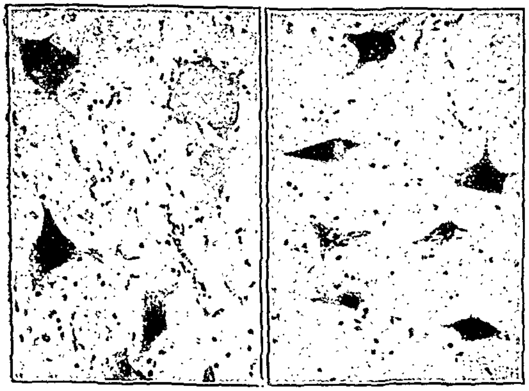
DR. J. G. GREENFIELD, *and* DR. NORAH SCHUSTER.

THIS case warrants description as an example of Landry's paralysis, confirmed by histological examination, and showing clinically the unusual feature of onset in the upper extremities.

The patient, a cashier, aged 43, was first seen by one of us (J. W. F. J.), on May 5th, 1927. She complained that while trying to pick up a bag of money with her left hand she had noticed a sudden loss of power in the left hand and arm. She had finished the day's work, using her right hand only. When seen in the evening the grip of the left hand was extremely weak, the right hand being normal. On May 6th the grip of the right hand became impaired, and in the course of the next two days the right arm became as weak as the left; there was practically complete paralysis of both arms. On May 10th weakness of both legs developed; this gradually increased up to the 13th, when she was seen by us both in consultation, and it was decided to move her *to the Weir Hospital.*

The *previous history* had been good, apart from chronic constipation. A few weeks before the onset of this illness she had had an "influenzal cold," and from the time she first came under observation it was noted that she had nasal catarrh, and a cough with scanty expectoration.

FIG. 1. FIG. 2.



Sections from spinal cord at level of the fourth lumbar vertebra (Fig. 1) and from hypoglossal nucleus (Fig. 2); some of the cells show achromatosis and some are normally stained

On admission to hospital she looked quite well in herself, and, apart from the excessive weakness of all the extremities, made no complaint of pain or other subjective symptoms. There was, however, extreme constipation and difficulty in micturition. On catheterisation 32 oz. of urine were withdrawn. The tongue was thickly coated, the fauces were injected, and muco-pus was seen in the pharynx. The cardiovascular system was normal. Râles were heard at the bases of both lungs. The abdomen was noticeably distended.

Examination of the central nervous system revealed no abnormality of the cranial nerves. The upper extremities were in a state of complete flaccid paralysis below the shoulder. Tendon jerks were only obtained with great difficulty, with the arm supported in the optimum position. Cutaneous sensations and muscle pain sense were present and normal. The lower extremities showed a similar condition of complete flaccid paralysis with normal sensation; tendon reflexes were obtained with difficulty, but the plantar response was flexor. Electrical reactions showed no response whatever to faradic current (Stuart and Bristow coil). Her temperature was 97·8° F., pulse-rate 72, and respiration-rate 20.

Lumbar puncture was performed, but revealed no obvious increase in pressure. The fluid was clear with no excess of albumin; the globulin test for excess was positive, slight opalescence appearing with ammonium sulphate. The sugar content was normal. A diplobacillus was present in the deposit, but was probably a contaminant. A cell count was impossible owing to delay in transit.

During the next three days the temperature rose to 100° each evening, and there was an increase of cough. On May 19th breathing became laboured, owing to interference with the diaphragmatic movements, and tubular breathing was heard at the left base. At 5.30 on May 20th the patient suddenly collapsed and died. Half an hour previously she had been perfectly conscious and in no pain.

Autopsy by Dr. Norah Schuster (Report on Specimens Received).

The specimen of lung showed broncho-pneumonic consolidation. The spleen was congested, but cultures from the pulp were sterile.

Sections of the spinal cord and peripheral nerves were stained by the following methods: (*a*) Sharlach R. (*b*) Hæmatoxylin. (*c*) Van Gieson. (*d*) Marchi's method for demonstrating degeneration (Nissl's nerve-cell stain).

Dr. J. G. Greenfield examined the sections in this case, sent to him by Dr. Schuster, and reported as follows.

Note by Dr. J. G. Greenfield.

"The changes present in the cord are those which have been constantly described in Landry's paralysis—i.e., chromatolysis of anterior horn cells and congestion of vessels. There was no evidence of degeneration in the emerging nerve-fibres, as shown by Marchi's method; in fact this stain revealed only the lipochrome in the nerve-cells, which was in slight excess of the normal.

"The vascular congestion appeared to affect the small veins chiefly, and the capillaries were not greatly distended. It is possible that it should be related rather to the dyspnœa from which the patient suffered than to a local congestion of the vessels of the cord. Many of the small veins contained very numerous leucocytes in addition to red blood corpuscles, and some were almost packed with these cells, but there was no evidence of thrombosis. At the level of the first thoracic segment there was a small hæmorrhage into the anterior horn, which must have taken place at least some hours before death, as the neighbouring nerve-cells contained dark doubly refractile granules which probably consist of hæmatin or some early decomposition product of hæmoglobin., There was no sign of lymphocytic infiltration either of the meninges or grey matter.

"Chromatolysis of the central type (axonal reaction) was most conspicuous in the large ventral horn cells of the lumbar enlargement. Here it affected almost every cell in varying degree, although at each level one or two normaly staining cells could be seen. The most affected cells were uniformly pale, and their nucleus was eccentric and subcapsular, and often presented an irregular outline.

"In the cervical enlargement also the majority of the cells had undergone a similar change, but in the thoracic region of the cord only one or two cells at each level were affected. In the hypoglossal nucleus and the nucleus ambiguus, similarly, the majority of the cells were normal and only a few cells presented minor degrees of chromatolysis. As a general rule the largest cells seemed to be more severely diseased than the smaller ones, although this appearance may have been due in part to the swelling which the cells had undergone in the process of chromatolysis. Vacuolation of the cell body was never seen. The cells of Clarke's column and those in the dorsal nuclei of the medulla appeared to be quite normal.

"The pathological examination therefore confirms the diagnosis of Landry's paralysis, which may be defined as an acute neuronitis limited to the lower motor neurones. There was no sign of inflammation apart from the vascular congestion which, as has been suggested, may have been due rather to back pressure than to local inflammation."

The diagnosis of Landry's paralysis in this case is founded on the following features: (1) The acute onset and rapid spread of a paralysis involving all the limbs and (terminally) the phrenic nerve. (2) The absence of sensory disturbance. (3) The demonstration in post-mortem sections of the spinal cord and peripheral nerves of an acute degeneration of the horn cells, and of the myelin sheaths, with no inflammatory reaction. The case presents unusual features in that clinically the paralysis was descending and not ascending; Church and Peterson describe two cases of this type. The post-mortem findings support the view originally put forward by Spiller that the toxic agent, whatever it may be (in this case apparently an acute nasal infection), acts on the lower motor neurones as a whole. Landry's paralysis is a rare disease. Only 16 published cases are on record in the last ten years, and in the majority post-mortem confirmation has been lacking.

ON THE

TRANSMISSION OF MAMMALIAN NEW GROWTHS BY FROZEN MATERIAL.

BY W. CRAMER, D.Sc. EDIN., PH.D. BERLIN, M.R.C.S. ENG.

(From the Imperial Cancer Research Fund.)

NUMEROUS experiments have been carried out in the past to determine whether mammalian tumours can be transmitted without the intervention of living cells. It was found that the inoculation of cells which had been killed by heat, radium, freezing, or mechanical disintegration gave negative results. Similarly, the injection of cell-free watery extracts of mammalian tumours has yielded negative results, except in the hands of one investigator. In the course of repeating these experiments the injection of watery extracts has given uniformly negative results in hundreds of experiments, if the absence of living cells was ensured by filtration through a porcelain filter, or by spinning and careful removal of the upper layer of the supernatant fluid. On the other hand, the inoculation of material obtained from six different strains of mammalian tumours by a course of repeated freezing and thawing has yielded in one strain a large number of positive results—73 positive results in 209 inoculated mice. This strain is the rapidly growing sarcoma 37 S. strain of the Imperial Cancer Research Fund. Three different rapidly growing carcinoma strains—Nos. 63, 91, 113—gave uniformly negative results. Experiments in the past in which negative results were obtained after freezing or mechanical disintegration were carried out with transplantable carcinomata. Two other rapidly growing sarcoma strains—the Jensen rat sarcoma and the Crocker mouse sarcoma—gave only a very low percentage of positive results, differing widely in this respect from the sarcoma strain 37 S. Thus the Jensen rat sarcoma gave five positive results in 102 inoculated mice; the Crocker sarcoma nine positive results in 79 inoculated mice. The tumours arising by inoculation of frozen material were always identical with the tumours from which the material was obtained. The positive results are not evenly distributed over the successive experiments. Thus, in the strain 37 S. with an average of 35 per cent. of positive transmission, half the experiments gave completely negative results, while the other half gave positive results in a very high percentage varying from 50 per cent. to 100 per cent., with an average of 70 per cent. After two hours' incubation of frozen material of 37 S., which by itself gave a high percentage of positive transmission, the property to transmit the tumour was either greatly weakened or completely abolished.

All attempts to obtain living tissue cultures from material subjected to the same treatment of repeated freezing and thawing have given negative results. Experiments carried out by Mr. H. G. Crabtree show that, contrary to statements in the literature, respiration and glycolysis do not completely disappear after repeating freezing and thawing. They are only greatly diminished. In this respect, however, no difference was observed between the cells of the sarcoma strain 37 S. on the one hand, and normal cells or the cells of the carcinoma 63 on the other, except that the diminution was much greater for malignant cells than for normal cells. The results may be summarised as follows:—

—		Tissue culture.	Metabolism.	Transmission.
Normal cells ..		Negative.	Present but diminished.	..
Carcinoma ..		"	Present but greatly diminished.	Always —
Sarcomata	J. R. S.	"		Rarely +
	Crocker	"		Rarely +
	37 S.	"		Frequently +

The interpretation of these results depends on what we accept as the criterion of death. If the failure of frozen material to live and grow when cultured in vitro is accepted as evidence that all the cells have been killed, then the results would demonstrate the transmission of at least one strain of a mammalian tumour without the intervention of living cells. The persistence of respiration after freezing and thawing is not necessarily evidence of the survival of a few cells, since in that case the tissue culture experiments should have given positive results and the transmission of the frozen carcinomata should also have given positive results, at least occasionally. The persistence of respiration may merely indicate that the process of repeated freezing and thawing, while destroying the structure of the cell, has left behind protoplasm in which the enzymatic processes of respiration and glycolysis are still proceeding.

On the other hand, it may reasonably be argued as an alternative explanation that the successful transmissions with frozen tumour material are due to the survival of a few living cells. Such an explanation is, however, not without difficulties. If that explanation is adopted one must assume that the sarcoma cells of strain 37 S. are more resistant to the lethal effect of repeated freezing than normal cells, the cells of carcinomata, and even the cells of the two other sarcoma strains investigated. One would further have to assume that the resistance of the cells of sarcoma 37 S. shows considerable variation at different times. As stated above, the quantitative measurements of respiration and glycolysis of frozen material give no indications of any such differences. The absence of all manifestations of life in the tissue culture experiments is also difficult to reconcile with such an explanation.

Since no direct evidence seems available by which this question can be decided it will be necessary to collect and consider circumstantial evidence, such as, for instance, the very evanescent nature of the property of frozen material (destruction by incubation for short periods) on which the power to transmit tumours depends. In any case it is justifiable to point out that until the successful transmissions with frozen material are satisfactorily accounted for as being due to a survival of living cells, the axiom of the non-transmissibility of mammalian tumours without the intervention of living cells is open to doubt.

A detailed account of the experiments on which this short communication is based will be published later.

THE QUEEN'S HOSPITAL, SIDCUP.—We have already announced that this hospital has been purchased by the London County Council for use as a general institution for post-operative cases. The hospital was built in 1917 in the grounds of Frognal House, the residence of the late Earl Sidney, for the treatment of facial and jaw injuries. Between August, 1917, and May 31st last year 18,135 patients were received; the facial cases included 714 officers and 8035 other ranks, and the major operations numbered 11,752.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF PSYCHIATRY.

AT a meeting of this Section held on Jan. 14th the chair was taken by the President, Sir ROBERT ARMSTRONG-JONES, and Dr. MACDONALD CRITCHLEY read a paper on the

PATHOLOGY OF THE SENILE PSYCHOSES.

The modern histological conception of the senile psychoses dated, he said, from the last decade of the nineteenth century, when Alzheimer had sharply distinguished arterio-sclerotic dementia from senile dementia. The distinction was of more theoretical than practical importance, as the cerebral arteries usually shared in the senile changes, though how far they influenced them was quite unknown.

The brain of healthy old age—if there were any such thing—showed a certain amount of atrophy with widening of sulci, reduction in weight, ventricular distension, thickening of the meninges, and sclerosis of the basal arteries. There was a disappearance of a number of nerve cells from the cortex, especially the frontal and prefontal regions, and from the basal ganglia, locus niger, and olives. The cells remaining might show fatty degeneration—the most constant feature—or the intracellular fibrillary tangles of Alzheimer, which varied from simple intensification of the fibrillary network to the reduction of the cell to a mere skeleton made up of tangled densely staining coils. Some believed these structures to be neuroglial, but most authorities regarded them as neurofibrillary. Bouman had drawn attention to a peculiar spindle- or torpedo-shaped swelling of the proximal portion of the axones of the Purkinje cells; the interior was homogeneous, but the periphery was reticular, and vacuolation might occur later. Disappearance of the neurone led to relative demyelinisation, which was most marked in the tangential fibres. Regressive glial changes took the form of a diffuse subpial, subependymal and perivascular gliosis, with frequent monster cells and reticulation. Regressive glial changes included the appearance of rod cells, especially in the molecular layers of the cornu ammonis, mucocytic degeneration of the oligodendroglia, and an increase in the amount of protoplasm in the microglial cells. The neuroglial changes in the cerebellum were essentially patchy, the gliosis being limited to the perivascular zones, the depths of the fissures, the white matter round the dentate nuclei, and the neighbourhood of the Purkinje cells.

The combination of diffuse gliosis with neuronal atrophy led to shrinkage and loss of weight, and hydrocephalus ex vacuo. The shrinkage was often most marked in the regions of the loci perforati posticus and lateralis, where the brain substance fell away from the basal arteries and caused wide perivascular dilatation.

Depositions in the senile brain included corpora amylacea, which appeared especially in the fimbria and round the blood-vessels, but which never aggregated, and senile plaques in the cortical grey matter. These plaques varied in form, but rings, radial figures, stars and discs were common, and there was often an amorphous or cellular nucleus, containing some amyloid-like substance. Sometimes the plaque contained lipoid, but the fatty plaques of Laignel-Lavastine and Tinel were regarded by Rizzo as artefacts. Microglia played a rôle in the formation of plaques, and neurofibrils and sometimes myelinated axis-cylinders were seen. Plaques were now usually regarded as a special type of tissue reaction directed against a specific and toxic metabolic process. A primary involutional alteration in the chemistry of the fundamental ground substance was believed to cause depositions of lipoid or amyloid material in the nervous system; these precipitates were strongly argentophil. They provoked a microglial reaction, and Hortega cells became incorporated in the innermost part and then underwent degeneration. It was doubtful whether plaques often occurred in the absence of psychical change during life.

There was a lack of certain knowledge as to the extent and relative frequency of the various histological changes in the senile brain. The common findings were diffuse fatty degeneration, a moderate degree of atrophy of nerve cells, and glial proliferation.

The Senile Dementias.

The change in senile dementia was in most cases an exaggeration of the histological processes seen in the healthy senile brain; there was no abrupt line of demarcation. This intensification might be selective. Dementia senilis simplex was characterised by an abundance of plaques, especially in the frontal and temporal regions; they might even be found in the central grey matter, the pons, the mid-brain, the cerebellum, and the spinal cord. It was not possible to distinguish the brain of a depressed senile dement from that of an agitated or a confused one. In Pick's disease there was marked localised neuronal atrophy, without any of the other changes except moderate secondary gliosis. The numerical atrophy was most obvious in the three upper cell laminæ of the cortex, and caused convolutional atrophy with widening of sulci. The change was usually symmetrical and often limited to the frontal, temporal, or occipital lobes. There was no explanation of the peculiar distribution. Alzheimer-Perusini's disease was characterised by a preponderating change in intracellular fibrils. The pathology of presbyophrenia had not been determined with certainty; recent studies tended to associate its pathological picture with that of Alzheimer's disease. Claude and Lhermitte had described a diffuse atrophic cortical sclerosis which was distinguished from simple dementia by a preponderating overgrowth of neuroglial fibrils, especially in the cortex. Probably there were other varieties of senile psychosis as yet unidentified. Clinical and pathological phenomena must be correlated with caution. The chemical and physical reactions of nerve tissue to various dyes were at best a very rough measure of the functional integrity of that tissue during life, and the presence of scarred or degenerated structures in the brain had not necessarily any connexion with signs or symptoms observed during life. Pathological findings were the outward signs of a particular type of tissue-reaction to some factor which was the basis of both clinical and pathological anomalies. Simchovicz had pointed out that the brain of a young senile dement was histologically indistinguishable from that of a normal centenarian, but the clinical pictures were widely different. According as the nature of the outside agent varied, so the cerebral histological reaction altered. The common features of senile psychoses were also found in very different conditions—e.g., swelling of the Purkinje cells in disseminated sclerosis, cerebellar atrophies, juvenile paralysis and schizophrenia, and senile plaques in Korsakow's psychosis and tabes. Some parts of the nervous system might be endowed with limited viability and be doomed to die before the rest of the system. Idiopathic Parkinson's disease was a senile process limited to the paleo-striatum; Jakob's senile rigidity showed plaques and other senile lesions in the corpus striatum; and in delayed cortical cerebellar atrophy the signs of progressive cerebellar dysfunction were linked with an atrophy of the paleo-cerebellum. There was urgent need for fuller information about senile cases, and for judicious correlation of clinical and pathological findings.

Discussion.

The PRESIDENT spoke of the difficulty of delimiting senility from the normal. The first function to decline in senility was recent memory; the nouns went first, then the adjectives, and finally the verbs. In premature senility the new engram might become obfuscated before the age of 40. Next came indifference to ceremonies and courtesies, ending in serious lapses. Cannon had shown that the effects of fear included marked changes in the Purkinje cells. Heredity had very little to do with the age of onset of senility. Moral habits were the first to go; the natural affections also became loosened and might be replaced by hatred. A peculiar characteristic was penuriousness or miserliness. Old people should not be sent to almshouses; they became much worse as the result of cutting off environmental stimuli. They should stay at the hearth among their grandchildren.

Dr. Kingston Barton emphasised the importance of memory, especially from the point of view of the general practitioner. There must be some change in the brain associated with the loss of memory. Remarkably few people over 65 escaped all the changes characteristic of senility.

Dr. A. G. Duncan said that the only constant biochemical indication of the metabolic changes of senility was the great increase in blood cholesterol, and asked whether this could be associated with the formation of plaques.

Dr. R. M. Stewart referred to the constant senile increase of cerebro-spinal fluid, which he believed to be proportional to the atrophy. This increase was not found in idiots. The plaques were in no sense necrotic; he asked how they stained with aniline dyes. Pick's disease was often overlooked, being taken for part of the cortical atrophy of old age: the disease was not necessarily limited to the frontal region, and might be related to genetically recent parts of the brain. Subcortical encephalitis had not been mentioned.

Dr. J. H. Earls asked whether the plaques which arose away from blood-vessels had anything to do with lack of blood-supply, and were comparable to similar changes in the myocardium.

Dr. Percy Smith spoke of the correlation of the new pathological findings with clinical observations. Some patients, who might be expected to have senile dementia, recovered, even at an advanced age.

Dr. C. W. Brasher asked if these atrophic changes were in any way associated with valvular disease of the heart. Cardiac cases were apt to become hallucinated during the night.

Dr. G. W. James said that Alzheimer's disease did not really belong to the senile psychoses; presbyophrenia and senile dementia were the outstanding examples, and were nearly always associated with increase of pressure and of cholesterol in the cerebrospinal fluid. The latter provided a prognostic point, for if it was low there was some hope of recovery.

Dr. Critchley, in reply, said he thought that theoretically senile changes and cerebral arteriosclerosis were entirely separate, although they were often coexistent. Subcortical encephalitis was essentially an arterial change. Changes in the choroid plexus were early and marked, and metabolic changes and increased permeability both played an important part in cerebral senility. Toxins which normally could not reach the cerebro-spinal fluid might in these brains be able to get through. Plaques stained only faintly with aniline dyes and required silver stains. The occipital cortex was commonly but the motor cortex very rarely affected in Pick's disease. The cardiac cases were probably associated with an ischæmic condition of the brain.

Purchase of St. Bartholomew's Close.—The governors of St. Bartholomew's Hospital have acquired St. Bartholomew's Close which is at present built over with shops, offices, and warehouses. It is hoped eventually to clear the site and erect upon it a residential college for students when means permit.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

At a meeting of this Society held at Manchester on Dec. 15th **Dr. Gordon Fitzgerald** gave a presidential address in which he pleaded for moderation in the "much too prevalent abuse of the trust placed by patient in doctor." He drew attention to the deplorable frequency with which details of illnesses and operations were divulged—the patients being referred to by name and discussed under conditions which left no doubt that the medical attendant was violating the confidence placed in him. He also pleaded for moderation in the extent to which the material advantages were permitted to dominate medical opinions of patients' ailments. Those practising gynæcology must be particularly on their guard against this, he said, for the general ignorance of the pelvic organs made people especially gullible on this subject.

Prof. Daniel Dougal demonstrated radiograms of

An Anencephalic Fœtus.

The patient was a primigravida aged 33, who was apparently three weeks post-mature. The fœtus lay transversely. The breech was distinctly felt to the right but the head was not satisfactorily defined. External version was attempted under anæsthesia but failed. An X ray photograph was taken and the radiologist reported that the cranial vault was not developed, and that there appeared to be defects of the lower cervical and upper thoracic spine. Medicinal induction was commenced, and an anencephalic fœtus was delivered normally 18 hours later.

Dr. Archibald Donald said he had recently seen a case in labour with some antepartum hæmorrhage where he could not feel a head. The patient's doctor wanted him to perform a Cæsarean section. He refused, and an anencephalic fœtus was shortly afterwards delivered.—**Mr. Leyland Robinson** showed a radiogram of an anencephalic fœtus for which previously he had considered treatment by Cæsarean section.—**Dr. J. W. Burns** referred to his "flying fœtus," already reported to the Society, which was diagnosed by X rays.

Dr. W. W. King reported a case of

Injury to the Rectum

caused by administration of a simple enema after labour. He referred to a case recorded by Prof. Fletcher Shaw in 1922, which resulted in permanent occlusion of the rectum.

In Dr. King's case a simple enema was given to a 6-para three days after a perfectly normal parturition. There was pain during the injection, with some bleeding and immediate swelling of the perineum. On the next day the pain spread to the abdomen, and she vomited. Twenty-four hours afterwards her condition was serious, with signs of peritonitis, and the perineum was enormously swollen and œdematous. The abdomen was opened, and purulent fluid (subsequently found to be sterile) was evacuated. The rectum and sigmoid were greatly swollen and dark blue in colour. A colostomy was performed, the peritoneal cavity drained, and a free incision was made into the perineal swelling.

Convalescence, said Dr. King, was stormy, and a stricture of the rectum resulted about 2½ in. above the anus. Five months later the colostomy was closed, but the stricture still remained, necessitating the regular use of rectal dilators. The hard nozzle of the enema syringe had been inserted into the rectum, and a sample of the soap used showed that it contained more free caustic and carbonate alkali than the British Pharmacopœia standard. He concluded that a soft catheter only should be inserted into the rectum.

Prof. Fletcher Shaw referred to his case, in which the injury had been caused during labour, and he had not seen it until three months later.—**Miss Ruth Nicholson** had seen two cases, in one of which the injury had occurred just before delivery and the other some time before the completion of labour. In the latter forceps were used to complete the delivery, which was followed by sloughing of the rectum and vaginal walls, and the prolapse of gangrenous loops of tissue out of the cavity, much resembling coils of small gut. This was followed by the death of the patient. Mr. KELLY had seen a similar case which he believed to be due to sloughing of the rectal mucous membrane, the enema fluid having been too hot when injected.

Prof. FLETCHER SHAW described a case of

Acute Sacculation of the Uterus.

This patient was a primigravida, 31 years old, and about three months pregnant. After two days' severe abdominal pain a cystic tender swelling was discovered on the upper surface of the uterus and of about the same size as the uterus. The swelling proved to be a thin-walled sac of uterine wall, and its cavity communicated with the cavity of the uterus by an opening which admitted two fingers. Both the sac and the uterine cavity were lined by fœtal membranes, and the fœtus moved freely from one to the other. The placenta was within the uterine cavity.

Two years later, said Prof. Shaw, the abdomen was again opened, and a slight groove could then be detected running across the fundus down both the anterior and posterior walls of the uterus which gave rise to the suspicion that there was some weakness at the place of fusion of the two Müllerian ducts, and that this place was unable to withstand the extra pressure due to the growing ovum, and so stretched to form this thin-walled sac.

Dr. J. W. BRIDE had seen a similar case in a primipara, but the whole uterus was involved.—Dr. DONALD had seen an infantile uterus becoming pregnant; the wall was very thin, but the patient had a normal labour.—Mr. J. ST GEORGE WILSON (Liverpool) suggested that the case was one of incomplete rupture of the body of the uterus.—Dr. S. B. HERD (Liverpool) suggested that there was malunion between the two halves of the uterus.

Prof. DOUGAL read notes of a case of

Hydradenoma of the Vulva.

The patient was a single woman, aged 52. There was a small cauliflower excrescence on the vulva about half an inch in diameter, pinkish in colour and situated on the left labium minus, a short distance below its bifurcation. The growth was removed locally and examined microscopically. The vulva was excised four weeks later. Prof. Shaw Dunn reported that the growth was an adenoma hydradenoide.

In these tumours, said Prof. Dougal, the growth resembled a small cauliflower projecting outwards beneath the epithelium. It was covered by stratified squamous epithelium which in some places was much thickened and in others worn away by friction. Leading down from the surface epithelium were several duct-like tubes which could be seen to merge with the mass of tubules of which the main tumour proper was composed. The tubules formed a complicated system, but were of uniform appearance, being lined by two layers of cells, an inner cylindrical and an outer cuboidal. In places there were masses of cells strongly suggestive of malignancy. The tubules resembled the ducts of sweat glands, and the tumour had evidently originated in one of these structures. The literature showed the difficulty of deciding whether these tumours were malignant. Outerbridge and Schwartz regarded as malignant any tumours of this type in which the acini had invaded the stroma or in which masses of polyhedral cells were found in the same situation. He had done a radical operation in this case because of the masses of polyhedral cells seen in his sections.

Sections showed the tumour to be a rapidly growing fibrosarcoma.

Prof. DOUGAL also reported a case of

Malignant Body of Uterus Incarcerated in a Procidentia.

The patient was a single woman, aged 58, and five years past the menopause. She had had prolapse for five years, and for the last four years it had been complete. Her main complaint was severe pain in the lower abdomen and in the procident mass; this was evidently due to incarceration of the contents, for the prolapse could not be reduced. There had been some irregular hæmorrhage for two weeks. Vaginal hysterectomy with colporrhaphies was performed. The uterus contained a large necrotic growth which proved on section to be an endothelioma. The right ovary contained a nodule of similar growth.

The points in this case were: (1) the occurrence of complete prolapse in a nulliparous woman; (2) incarceration of the enlarged uterus in the procidentia; and (3) the nature of the tumour—an endothelioma.

Mr. N. L. EDWARDS (Derby) showed a specimen of primary squamous-celled carcinoma of the vagina, and Prof. DOUGAL demonstrated radiograms from a case of intestinal carcinoma, and described a case of sarcoma of the broad ligament.

AUSTRALASIAN COLLEGE OF SURGEONS.

ANNUAL STATE MEETING IN QUEENSLAND.

AT the meeting of the College held in Brisbane on Nov. 15th, 1929, an address was given by Dr. R. B. WADE, of Sydney, on

LEFT LUMBAR RAMISECTION IN HIRSCHSPRUNG'S DISEASE.

The condition, said Dr. Wade, was described first by Parry in 1825. Of the many theories advanced to explain the causation that of neuromuscular incoördination was most widely accepted. There was the double innervation of the bowel to bear in mind, and the various sphincters, particularly that described by O'Beirne at the pelvirectal junction. Two theories of the action of the sympathetic were held: (1) that it was the active agent in causing contraction of the sphincters, (2) that its function was to maintain postural tone (Hunter and Royle). In this way the viscera adapted themselves to changes in volume of their contents, and the sphincters contracted until the call came for the passage of the contents. On the one theory there was active contraction, on the other an absence of relaxation; in either case overaction of the sympathetic would give the same result. With the former view hypertrophy of the sphincter would be anticipated.

In the development of the child, Dr. Wade went on, the inhibitory apparatus lagged behind the motor and was last acquired. In infantile achalasias, such as those at the cardia and pylorus, the time limits of the obstruction appeared definite, and if the child survived until the time that inhibition was acquired it would recover. This did not appear to apply to achalasias of the rectum. The achalasias appeared at different periods; they might occur in the very early days of life as a result of incoördination, or in later life, owing to a local degeneration of the neuromuscular mechanism. Hurst considered the disease to be due probably to an incoördination resulting in failure of relaxation at either the pelvirectal sphincter or the internal sphincter ani. In Hirschsprung's disease there was no proof of hypertrophy of either of these sphincters, and clinically there was no spasm. Dr. Wade, however, quoted three examples which suggested some form of obstruction occurring at the pelvirectal sphincter in these patients.

The three cardinal symptoms and signs were constipation, abdominal distension, and peristaltic waves; of these the latter might be absent in the milder cases. Constipation was the predominant symptom. Attacks of abdominal distension occurred, associated with vomiting; these usually were relieved by freely emptying the pelvic colon. X rays showed the bowel evenly distended with a smooth contour and an absence of haustration. Administration of insufficient enema might cause fallacies; a baby suffering from Hirschsprung's disease could retain 1½ pints, an older child 2 pints. In treatment, diet alone had not been a great success; a daily purge and enema would keep the child in moderately good health; dilatation was stated to have had some success. In ileosigmoidostomy and colectomy the anastomosis must be made above the sphincter; following it the dilatation reproduced itself in the ileum.

A Series of Cases Described.

Operation on the sympathetic, as suggested by Dr. N. D. Royle, had been carried out in 13 patients, with, in the main, satisfactory results. In this operation, an exposure of the left lumbar trunk of the sympathetic was made through a lumbar incision, somewhat similar to that exposing this part of the ureter. The nerves severed were the white ramus from the first lumbar nerve to the first lumbar ganglion and, if there was a large branch from the second nerve to the second ganglion, this also was divided. All the branches (usually four) leaving the ganglion on the medial side, and one from the first and second ganglia, and one or two smaller ones from the fourth were severed, and the cord cut across below the fourth ganglion. Operation on the left side only was found to be sufficient in all the patients except one. Dr. Royle had shown in experiments on goats that when this operation is carried out on both sides, though no actual paralysis of the sphincters occurs, micturition and defæcation become more frequent.

Thirteen patients were submitted to operation, their ages ranging from one month to 12 years. There was one death, that of a child, who died from pneumonia two months after operation. One child showed no improvement until the operation had been performed also on the right side. The remaining children showed considerable improvement in their general condition and constipation was relieved, while the abdominal distension and dilatation of the colon remained unchanged. There was, however, a gradual decrease in the size of the abdomen and in the calibre of the distended colon. In the first patient, operated on in August, 1926, the abdomen was now almost flat, although a distended pelvic colon was palpable; X rays taken some years after the operation showed haustration in the ascending colon. The operation relieved the constipation completely. The improvement manifested itself soon, but not necessarily immediately, after the operation. Care must be taken to ensure regular habits.

Dr. Wade also described the case of a girl aged 19, suffering from visceroptosis with marked constipation, in which the operation was carried out. The excellent result obtained suggested that this was a somewhat similar condition of neuromuscular defect.

SHEFFIELD HOSPITAL FINANCE.—The budget for 1930 of the Sheffield Joint Hospitals Council estimates the expenditure of the four voluntary hospitals of the city at £169,035; the expenditure of the council services is put at £28,000. The ordinary income of the four hospitals, apart from receipts from the penny-in-the-pound scheme, is estimated at £42,381, and the amount to be raised by the Joint Hospitals Council at £145,744.

WORKSOP POOR-LAW INFIRMARY.—Mr. Arthur Neal, chairman of the Sheffield Board of Guardians, last week opened extensions of this infirmary at Kilton Hill. The enlargements include a new administrative block and nurses' home, and rooms for the medical and nursing staff. Mr. Neal pointed out that, when the work of the guardians is taken over by the county council, it will be necessary to extend existing institutions or build new ones if waiting-lists were to be done away with.

ST. MARY'S HOSPITAL, PORTSMOUTH.—Dr. R. C. Macpherson, the medical superintendent of this hospital, states that the record of its nurses in the State examinations "has never been beaten by any institution in the country." They held a record of 100 per cent. successes for two years and nearly 100 in the other three years. "Only on one occasion, and that for one year only, has any other institution gained 100 per cent. success in that examination." The hospital contains 1000 beds and the daily average of patients is 950. It is not a surgical hospital, but last year there were 800 operations.

Reviews and Notices of Books.

PUBLIC HEALTH AND HYGIENE.

Public Health and Hygiene in Contributions by Eminent Authorities. Second edition. Edited by WILLIAM HALLOCK PARK, M.D., Professor of Bacteriology and Hygiene, University and Bellevue Hospital Medical College, and Director of the Bureau of Laboratories of the Department of Health, New York City. Philadelphia: Lea and Febiger. Pp. 902. $9.

THE second edition of this book, which has been thoroughly revised and brought up to date, is a welcome addition to the rapidly growing literature of preventive medicine. It is divided into 34 chapters contributed by 24 well-known writers, each dealing comprehensively with his own particular specialty. The work is really a series of authoritative monographs so planned that while each is in itself a complete résumé overlapping and repetition are avoided and the finished product is a homogeneous and concrete whole. The treatment of public health problems is, of course, essentially American, but there are many references to English and continental standards and practice.

Almost one hundred pages are devoted to bacteriology and immunology as applied to public health, including a full description of modern methods of diphtheria prophylaxis—a subject of which Prof. Park writes with the authority of a pioneer. The claim that this procedure confers life-long immunity against diphtheria, however, must be regarded as premature; the statement that sewer gas predisposes to this disease seems out of place in a work containing so much sound, modern teaching. We doubt whether the recommendations of the American Public Health Association for the community control of influenza (pp. 98–103) deserve the space accorded them in a work of this kind. Again, the absolute isolation of public institutions for the whole of an influenza epidemic, and for some weeks before and after, is a counsel of perfection which under modern conditions hardly permits of practical application. In view of the reports from Canada as to its value it is surprising to find no reference to the serum treatment of anterior poliomyelitis (p. 117). The emphatic statement that vaccination is the only satisfactory means of controlling small-pox requires some modification in the light of modern experience of the non-classical type of the disease, about which nothing is said, and the assertion that there are no contra-indications to vaccination takes no consideration of work on post-vaccinal encephalitis. Not many of our cities can have been so fortunate as New York, where (p. 144) "there has not been a death for several years from any complications of vaccination." It is disappointing to find the consideration of the differential diagnosis of small-pox compressed into a rather unhelpful footnote. A separate chapter is given to aseptic technique in the handling of communicable diseases; the busy medical superintendent of a large fever hospital in this country is likely to reject the scheme outlined as impracticable, by reason of the time involved in its execution and difficulties of staffing. The section on epidemiology (pp. 248–259) is eminently practical and concludes with a recital of some of the unsolved problems in the transmission of communicable diseases, together with a plea for combined effort in their elucidation. The subject of ventilation is thoroughly dealt with; the British reader will be astonished to learn that the Americans were first in the field with the modern conception that physical rather than chemical factors are responsible for the vitiation of the atmosphere.

The present state of our knowledge of vitamins is described in a useful section in which irradiated milk is strongly advocated as a potent agent in the prophylaxis of rickets. The American preference fod cleaned rather than clean milk appears again anr again. One wonders what were the *B. coli* contents of the samples in which total bacterial counts were measured in millions per c.cm. In their regulations for controlling milk-supplies the Public Health Council of New York State include the power to examine body discharges of workers in pasteurised and general milk-supplies. A useful note is that on oyster contamination viewed from the bacteriological aspect. The figure for the incidence of defective vision among school-children, suggested by the American Council of Eyesight Conservation (60 per cent. so defective as to need correction), astonishes us, and that for juvenile mental deficiency (2 per cent. of the population) is also surprisingly high. The procedure described for the school exclusion of infectious diseases contacts seems unnecessarily cumbersome; the treatment of ringworm of the scalp recommended (p. 691) is much less effective than X ray therapy. Useful sections are those dealing with social and economic factors in relation to disease transmission and infant mortality. Those on mental hygiene and maritime hygiene are also good; in the latter the amount of sulphur necessary for effective ship fumigation is, however, overstated and no reference is made to the International Convention of Paris, 1926. The value of mental hygiene in relation to the child guidance movement and the prevention of juvenile delinquency is clearly stated, and the rôle of the nursery school as a promoter of mental hygiene is convincingly explained.

We have indicated places where it seems that further attention might well be employed in the improvement of the book, but the suggestions for emendation are few when its scope is considered, while of its value for reference there can be no doubt.

STARLING'S PRINCIPLES OF HUMAN PHYSIOLOGY.

Fifth edition. Edited and revised by C. LOVATT EVANS, D.Sc., F.R.C.P., F.R.S., Jodrell Professor of Physiology in University College, London. The chapters on the Central Nervous System and Sense Organs revised by H. HARTRIDGE, M.A., M.D., Sc.D., F.R.S., Professor of Physiology at St. Bartholomew's Medical College. London: J. and A. Churchill. 1930. Pp. 1039. 21s.

IT is satisfactory to find that this well-known book, which has assisted generations of students through the higher examinations in medicine and physiology, is not to pass away with its original author. Prof. Lovatt Evans states in his preface to the fifth edition that Prof. Starling asked him to revise the work immediately after the war, but that he was unable to do so then. After Starling's death, however, he felt compelled to accept a task which it was clearly his colleague's wish that he should undertake. It is not necessary at this stage to describe the contents, aims, and objects of this work. One who wishes to obtain a sound knowledge of physiology can do no better than read it carefully and to make it the foundation of his knowledge. This applies equally to men working for their medical examination or for more advanced ones, such as the primary fellowship or the higher examinations in medicine. If students read this book thoroughly and carefully before proceeding to speculative and possibly transient monographs, the examiners for higher degrees would not so frequently encounter candidates whose general physiological knowledge is sadly defective.

The most notable addition to the book is the complete revision of the chapters dealing with special senses and the central nervous system by Prof. H. Hartridge. The last-named section contains a whole series of chapters or parts of chapters on postural reflexes, group control, and conditioned reflexes. The section on the physiology of muscle and nerve reflects the teaching of Prof. A. V. Hill and his co-workers, and in itself provides an almost complete monograph. The subject of oxidation and reduction in the animal body seems unduly compressed. In hardly more than two pages Prof. Lovatt Evans has certainly summarised the new work admirably, but no mention has been made of the oxidation reduction potential theories, and reference to the work of Otto Warburg might well have been expanded; only some two or three lines are devoted to this important work on tissue respiration and glycolysis—indeed very little is said about glycolysis anywhere in the book. The section dealing with gastric secretion is rather involved. The methods for investigating normal human stomachs are not described until comparatively late in the chapter, when the fractional method of gastric analysis is dealt with. In his desire to include all the latest work on the subject Prof. Lovatt Evans has included observations which contradict each other. The section on metabolism has been altered considerably, and the most recent views on insulin have been included. Perhaps the greatest changes involve the section on reproduction. This section now includes much recent work on the ovarian and œstrus-producing hormones; the relationship between the secretion of the anterior lobe of the pituitary and ovarian function is not discussed.

The work as a whole commands whole-hearted admiration; it will undoubtedly remain one of the most popular standard text-books on physiology in our language.

PULMONARY TUBERCULOSIS.

La tuberculose pulmonaire: guide du malade et du prédisposé. By Dr. JACQUES STEPHANI, Montana. Paris: Payot. Pp. 314. Fr.25.

IN 1928 Dr. Stephani wrote a small book in English entitled "Consumptive," to which this is complementary. Both books are written in large measure for the guidance and instruction not only of the medical man, but of the patient. It is addressed to a class of patients, differing markedly in their psychology from any other class. The amazing optimism, the cheerfulness of the young person suddenly deprived of liberty, the alternating phases of exaltation and depression, are familiar to all those who have to do with the tuberculous patient, and cannot be lightly dismissed. The fact that many of these patients study any medical book dealing with their condition, often to their mental distress, makes us view with sympathy a book such as this one, written in an encouraging style by a physician who is possessed of genuine knowledge of his subject. It can do no patient harm to read the heading to Chapter XIV., "Pulmonary Tuberculosis is the Most Curable of all Chronic Diseases," and he will be greatly helped in his fight by a study of the delightful Japanese fable at the introduction to Chapter XXIV., in which the author deals with the grave question of the personal responsibility of the patient. The book is written in simple and not over-technical language. It omits nothing of importance, and may be read with profit by all whose daily work brings them in contact with that most delightful, though possibly difficult patient—the individual who has been notified as suffering from pulmonary tuberculosis. Such a patient may at first be apt to regard himself as isolated from the rest of humanity. His reactions to the realisation of the fact that his mode of life and his activities have been profoundly altered, and that the change must last for a long period of time, will be favourably influenced by the study of this book.

La pratique du pneumothorax et de la collapsothérapie chirurgicale. By F. DUMAREST and P. BRETTE. Paris: Masson et Cie. 1929. Pp. 409. Fr.50.

THIS is a very complete account of the treatment of pulmonary disease by collapsing the lung. The first nine chapters deal with artificial pneumothorax. Many different types of apparatus used for this purpose are described, some very simple and others complicated, but all effective, so that the choice of apparatus really becomes a matter of individual preference. The authors point out that a pneumothorax depends on the elasticity of the lungs and on the respiratory muscles, and that it is not merely a matter of compressing the lung by so much pressure of air. The collapse depends upon the individual. The immediate and late results of pneumothorax treatment are given, and there is a good discussion of the vexed question of when the lung should be allowed to re-expand. A chapter is devoted to bilateral pneumothorax, and the effects of collapsing both lungs simultaneously are compared with those of collapsing first one lung and then the other. The last chapter deals with phrenicotomy and thoracoplasty, and the indications and advantages of these surgical methods are compared with those of artificial pneumothorax. The book is very readable, and has a full list of references.

ULTRA-VIOLET RAYS.

Ultra-violet Rays in the Treatment and Cure of Disease. Fourth edition. By PERCY HALL, M.R.C.S., L.R.C.P., Hon. Actino-Therapist, Mount Vernon Hospital. London: William Heinemann, Ltd. 1929. Pp. 248. 12*s.* 6*d.*

THE fourth English edition of this manual—there have also been two American editions—has been brought up to date and contains some new features. Two new chapters, one on self-administration and one on dosage, will prove of value to the beginner. The information given in this popular introduction to actinotherapy is clear and accurate, although elementary in its presentation. There is a laudable attempt to avoid speaking of "ray-therapy" as a whole, and the author is at pains to point out that waves of different wave-lengths may initiate very different if not opposing reactions. Dr. Percy Hall is an enthusiastic believer in actinotherapy for selected cases of pulmonary tuberculosis. Unlike most other workers in this field he makes extensive use of the tungsten-arc lamp and in cases of laryngeal tuberculosis directs both the light and the fumes of this lamp into the air passages. In his introduction to this manual Sir Henry Gauvain states that he has used Dr. Percy Hall's tungsten-arc lamp with excellent effect, and that the good results obtained by the author will induce others to follow in his footsteps.

EMBRYOLOGY AND ANATOMY.

The Essentials of Human Embryology. By GIDEON S. DODDS, Ph.D., Professor of Histology and Embryology, School of Medicine, West Virginia University. New York: John Wiley and Sons. 1929. Pp. 316. 20*s.*

FOR some years past a steady flow of books on embryology has set in from across the Atlantic, any one of which might, in many ways, serve in place of one of the others if this were by mischance mislaid. Most of them give the reader beautiful figures showing the gymnastic contortions of chromosomes, other beautiful figures with which we have been on intimate terms since the earliest days, and still more beautiful figures of sections of chicks or pigs or other interesting but non-human embryos. They provide as a rule good accounts of the early conditions and general questions connected with development, and then furnish quite inadequate and sometimes misleading descriptions of organogenetic processes. There seems to be a desire to cut down details of the actual formative occurrences in the various parts of the body to a minimum. Surely this is not the right way to make the development of the body of value; it would seem that the standard adopted was set by an examination syllabus rather than by a wish to give some understanding of the subject to the reader. One knows what one will find before opening one of these works. They all grind out the same melody, only altering the key. Presumably they are absorbed, since they are produced, but anyone fortunate enough to possess one of them might refrain from spending money on its successors, at any rate for a few years. Moreover, we cannot help feeling that organogenetic development, as it is taught in England to-day, is more consonant with the facts and of more use and value than some of the hoary legends which serve their turns beyond their normal span of life.

Dr. Gideon Dodds's book is in many ways free from these faults. The figures are good and are mostly new and selected for their object. The text is pleasantly written, in good English. The general accounts are clear and adequate, but we would have liked to see more topographical detail in the descriptions of development of organs and regions. It is possible that this may be due to the effort to meet the word "Essentials"; anatomical "essentials" for the neurologist differ from those considered essential by the gynæcologist, and similar relativities hold in the world of descriptive embryology. In any case Gideon Dodds has produced a very readable book, even if the multiplication of the species to which it belongs calls for mild protest.

Applied Anatomy. Eighth edition. By GWILYM G. DAVIS, M.D., late Professor of Orthopædic Surgery and Associate Professor of Applied Anatomy, University of Pennsylvania. Revised by GEORGE P. MULLER, M.D., Professor of Clinical Surgery in the University. London: J. B. Lippincott Company. 1929. Pp. 638. 42*s.*

THIS well-known work, which has been brought out three times since Prof. Davis's lamented death, is now issued again with some slight revision. It is unnecessary to do more than call the attention of readers to this fact, for the book has long passed the stage of criticism and is one of the standard medical works.

RACIAL HYGIENE.

Die Deutschen und ihre Nachbarvölker. Neue Grundlegung der Anthropologie, Rassen-, Völker-, Stammeskunde und Konstitutionslehre nebst Ausführungen zur deutschen Rassenhygiene. By Prof. Dr. WALTHER KRUSE. Leipzig: Georg Thieme. 1929. Pp. xiv. + 640. G.M.41.

Prof. Kruse is Director of the Institute of Hygiene of Leipzig University, but in this book he is concerned almost entirely with anthropological and not medical matters. His interest in both subjects dates from more than 40 years ago, when he worked for a time with Rudolf Virchow.

Abrupt opening is made with a criticism of the scales used to match hair and eye colours, and the presentation of new ones which are said to be comparable with the widely used scales of Fischer and Martin. The most important statistics which have been compiled for integumentary colours are then considered. As with the other body characters, the distribution within Germany is first dealt with and then the distribution for Europe as a whole. The frequencies are represented on good maps. Other features discussed in turn are the stature, cephalic index, and several facial measurements, and reference is also made to the available material relating to skulls. The nature of the profile is then considered in detail, as it can be appreciated from living and cranial measurements and qualitative descriptions, such as the grouping of nose-shapes. Composite photographs of the full face and profile views of 28 groups of German men, and of all the groups combined, comprising 800 individuals, are given in Plates III. and IV. and there are some composites for other races in Plate V. These have evidently been prepared with great care, but they are unfortunately reproduced on a very small scale. Body measurements and the blood tests used in recent years, which are claimed to discriminate racial types, are also dealt with.

After treating the living populations thus Prof. Kruse discusses the relationships of extinct races as they are known from a study of their skeletons and principally of their crania. Nearly half of this long book is taken up with the presentation of data such as these, the characters being considered separately and with regard to their geographical distributions. The remainder is concerned with an attempt to reconcile the conclusions which the different kinds of evidence suggest and with the more general aspects of the subject, such as the variability and correlation of the characters, the way in which they are inherited, and the effects of environment and selection. The association of the various anthropological characters is considered in detail. This is the weakest part of the book, since the author, though acknowledging the need for metrical description, has refused to use modern statistical methods and his treatment by percentages is out of date. The relations of race, mentality, and culture are also dealt with. In conclusion, the presumed racial constitution of German peoples is set forth and something is said of their racial hygiene.

This book may be recommended to anyone who is interested in the main results of the anthropological investigations into the constitution of European races in general, and of the races of Germany in particular, which have been conducted in the past 50 years. It is a conscientious summary of a vast mass of material.

ESSENTIALS OF MEDICAL ELECTRICITY.

Sixth edition. By ELKIN P. CUMBERBATCH, B.M. Oxon., D.M.R.E. Camb., M.R.C.P., Medical Officer in Charge, Electrical Department, St. Bartholomew's Hospital. London: Henry Kimpton. 1929. Pp. 443. 10*s.* 6*d.*

SINCE the publication of the last edition of this well-known text-book eight years ago several important developments have taken place in the art of electrotherapeutics. One of the chief of these is the extension of the use of diathermy, especially in the treatment of disease of the pelvic and genital organs. Dr. Cumberbatch has accordingly entirely rewritten his chapter on diathermy, and has incorporated the methods devised by his colleague Dr. C. A. Robinson. He has also surveyed the uses of diathermy and high-frequency currents in surgery. The revision, as the result of experience, of our early ideas about ionisation has led to an unfortunate neglect of galvanotherapy in general. The author has, however, stressed the value of the direct current apart from its "iontophoretic" properties, which are now recognised to be very limited, and has amplified the sections on iontophoresis without therapeutic ions—or ordinary direct current treatment—and on electro-chemical cauterisation, the other two branches of galvanotherapy. New chapters on the sinusoidal current, and the combination of acupuncture with the galvanic current, have been added. The difficult subject of electrical reactions has been elucidated by several new diagrams; the use of condensers is described, and a section has been inserted on the difficult concepts of chronaxie and rheobase. The whole volume has received detailed revision, and can be commended anew as a thoroughly comprehensive and up-to-date work.

VERNES TEST IN TUBERCULOSIS.

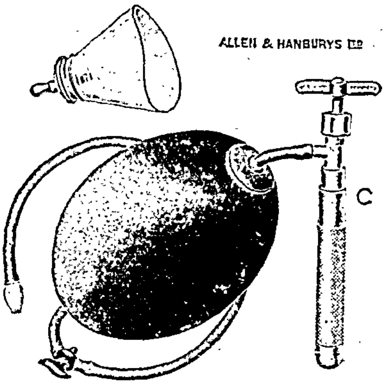
Étude de la réaction de Vernes a la résorcine dans le diagnostic et le pronostic des tuberculoses. By ANDRÉ BRETON, Ancien Interne des Hôpitaux de Lille; Preparateur a l'Institut Pasteur. Paris: Masson et Cie. Pp. 150. Fr.20.

THIS book is a monograph dealing with the application of the Vernes flocculation test for syphilis to the field of tuberculosis. The test consists in the estimation of the amount of flocculation produced when resorcin is added to the serum of a tuberculous patient. This estimation is carried out by means of a Vernes photometer, introduced by the worker whose name it bears, and used extensively in the Institut Prophylactique in Paris. Vernes divides the readings into three zones: (1) negative; (2) intermediate or doubtful; and (3) diagnostically positive. The claim is made that, with the accurate technique of the elaborately constructed photometer, better results can be obtained than with other diagnostic serum tests. This monograph assembles results obtained by various workers, with some case-records, curves, and a bibliography. The complement-fixation test for tuberculosis is also touched upon, but merely to make an unfavourable comparison of its value with that of the Vernes test. No description of the Vernes apparatus is given in the book. In our view the specificity of flocculation with resorcin and tuberculous serum is still unproven, and in any case, the cost of the Vernes apparatus puts it outside the scope of most clinical laboratories. This monograph seems to be an attempt to vindicate the results obtained by the advocates of the test, rather than a working description of the technique, or a critical analysis of the methods.

Corrigendum.—The author of a Manual for Patients Suffering from Diabetes Mellitus, reviewed on p. 84 of our last issue, is Dr. J. Knowles Lund. We regret the inaccuracy.

New Inventions.

PORTABLE OXYGEN INHALING APPARATUS.

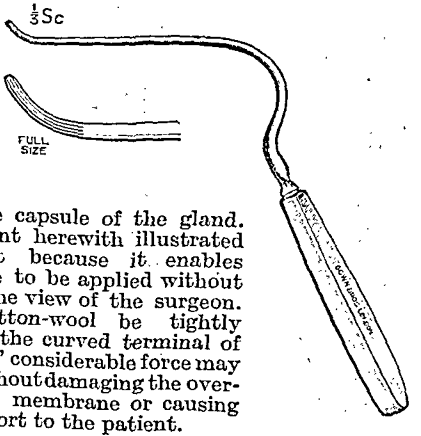


PATIENTS who find relief from oxygen inhalations have complained of the inconvenience of the large oxygen cylinder when they are travelling. In order to meet with this difficulty, Messrs. Allen and Hanburys, Ltd., Wigmore-street, London, W., have made for me a small portable apparatus which is illustrated above.

London, W. L. S. T. BURRELL, M.D.

A TONSIL PRESSOR.

IT is a common experience to find that a healthy looking tonsil contains septic material in the depths of its crypts and that this can only be made to exude on the surface of the tonsil by pressure on the outer and embedded regions of the capsule of the gland. The instrument herewith illustrated is convenient because it enables such pressure to be applied without obstructing the view of the surgeon. If some cotton-wool be tightly wound round the curved terminal of the "Pressor" considerable force may be exerted without damaging the overlying mucous membrane or causing much discomfort to the patient.



The instrument has been made for me by Messrs. Down Bros., St. Thomas's-street, S.E.

HERBERT TILLEY, F.R.C.S.

THE LANCET.

LONDON: SATURDAY, JANUARY 18, 1930.

CHEST COMPLICATIONS AFTER OPERATION.

DURING the last few years the problem of postoperative pulmonary complications has been approached from many different angles. A great deal of experimental work has been done, and although its results are much what might have been expected, they nevertheless serve to emphasise facts which are apparently obvious and correspondingly often overlooked. For instance, it is hardly surprising to find that a patient's vital capacity is considerably reduced by having a large and recent incision in the abdomen and his lower ribs constricted by a tight binder, but it is important to realise how great this reduction may be, and after which operations it is greatest. Again, few would question the possibility of producing pneumonia by introducing virulent organisms directly into the lungs, yet some observers who realise how difficult it may be to infect dogs in this way would prefer to regard postoperative pulmonary infections as being conveyed to the lungs from the site of operation by way of the blood or lymph stream. The painstaking researches of CHARLTON BRISCOE and others have shown that the physiology of respiration and the normal function of, and balance between, the various respiratory muscles is not so simple as it once seemed.

In spite of all this work it is clear that no great advance has been made in reducing the frequency of these complications, for in our present issue Dr. C. J. FULLER records a series of cases with a higher incidence of complications than any similar series of recent years. His analysis, like others, shows that pulmonary complications most frequently follow operations on the mouth, larynx and pharynx, and those involving an abdominal incision. Other important factors, in his opinion, are preoperative infections of the lung, and toxic complications such as perforation of an ulcer or strangulation of a hernia. The complications fall naturally into two groups—the embolic and the inflammatory. As regards the inflammatory group, it is pretty generally agreed that either a chronic infection is stirred into activity by the anæsthetic or that septic material is inhaled into the lungs during unconsciousness; and it seems reasonable to make inhalation responsible for the prevalence of pneumonia after operations on the mouth and throat. All the same, some observers hold that there is really only one group, and that postoperative pneumonia is caused by irritation or infection of the lungs by a shower of minute emboli arising from the site of operation. FULLER sides with the majority in rejecting this theory. The main arguments against it are, first, that in a very large number of cases no site of origin for the supposed emboli has been found post mortem; secondly, that cases of undoubted infarction run a different clinical course from the majority of postoperative pneumonias and have characteristic features at necropsy; and, thirdly, that it does not account for the prevalence of chest complications in two definite groups of operations and their comparative rarity in others. However distinct the two groups may be in their pathology, there is a growing weight of evidence that they have an important common factor—namely, inertia, and particularly diaphragmatic inertia. Inhibition of the diaphragm by the pain of stretching an abdominal incision, and of the lower ribs by a tight binder, will clearly reduce aeration at the bases of the lungs. If a portion of lung is airless, the secretion cannot be coughed out of it, for the action of a cough is that of a pop-gun, and without air behind it the sputum, like the cork, will remain stationary. It is for this reason that in many case of bronchiectasis posture is the only means of draining away the sputum; it lies at a dead end with no air behind it. If septic material has been inhaled during the unconscious period it will tend to stagnate in the lungs as a whole, because the range of respiratory movement in a patient lying quiet and prostrate in bed will be small; it will be especially small at the bases because, for the reasons given, aeration in this region is specially restricted. Further, the strength of a cough depends on the vigour of contraction of the abdominal muscles, and if these are the site of a more or less painful incision they are not likely to contract briskly; so, even if air is present, coughing will be painful and therefore weak. Inhibition of these muscles also has another effect. The venous circulation from abdomen to thorax is very largely maintained by the production of a negative pressure in the chest, and a simultaneous rise of pressure in the abdomen, by means of diaphragmatic contraction during inspiration. It has been suggested that this mechanism is impaired after abdominal operations, the result being venous stasis and a liability to thrombosis and embolism. In practice two questions have to be answered: how can we best avoid introducing septic material into the lung, or lighting up a latent infection, and how can we best maintain efficient pulmonary ventilation, and particularly diaphragmatic movement, after the operation is over? Attempts to answer the first of these questions include administration of atropin before anæsthesia; routine dental and pulmonary examination before operation; adoption of a special posture or plugging of the fauces in operations on the mouth; and either modification of the standard anæsthetic or postponement of the operation if chronic infection is found. When we come to the second question it must be admitted that few systematic attempts to deal with the problem have been described. It is of interest that FULLER reports the result of an experiment in organised deep breathing, and while it is to be feared that his popularity in the wards was not enhanced, and the result was discouraging for the reasons that he indicates, there can be no doubt that theoretically such respiratory gymnastics are absolutely correct. If abdominal cases (whenever possible) were nursed in Fowler's position, directly they had recovered from the anæsthetic, and made to recline first on one side and then on the other, so that each lung in turn was put in the best position for full expansion, better results might perhaps be obtained. The relatively small incidence of pulmonary complications in lower abdominal cases may be due to their being often nursed in Fowler's position.

There is a third type of pulmonary complication which may follow operation—namely, massive collapse. Here, again, there are two schools of thought, which seem to depend to some extent on whether the observer has been studying postoperative cases or not. Many cases have been reported, particularly during the late war, in which massive collapse followed rapidly on an injury to the abdomen or chest. Some of these injuries were penetrating and others were not, and in some the-financial basis, and it was hoped that the pathological laboratory would " keep alive that glow of intellectual vitality which medical education inspires, and constitute a centre to irradiate the remoter hospitals for the insane in Scotland."

The thirty-second annual report of the Asylums Research Laboratory for 1928 shows that the objects of the founders of this scheme are being fulfilled. In addition to routine investigations and visits, the pathologist, Dr. F. E. Reynolds, together with Dr. Logan Turner, has published a number of papers on research, and has made progress with his scheme of establishing a centre of neurology in Edinburgh University. Among the lecturers at the 1928 annual course on neuropathology was the first assistant pathologist, Dr. David Orr.

VAGINAL EXAMINATION IN THE THIRD STAGE OF LABOUR.

If there is one guiding principle in midwifery that has been generally accepted, it is the strict limitation of all internal examination and manipulation because of the risk of carrying infection from the surface of the body into the genital canal. The anal, perineal and vulval areas cannot be made germ-free, and the tendency in modern obstetric practice has been towards the improvement and development of methods of external examination and manipulation in order to obviate the risk of passing through a germ-bearing area. Hospital statistics prove the reality of these dangers, for morbidity increases with interference and grows greater as this interference extends upwards, reaching a maximum after manual removal of the placenta. Hence any suggestion to increase internal intervention must be very clearly investigated to find whether its advantages to the patient will outweigh its undoubted disadvantages. This applies emphatically to Dr. Morris Leff's[1] advocacy of vaginal examination after the fœtus is born in order to discover if the placenta has separated. His paper is based on a series of 1000 consecutive cases, and contains some useful contributions to our knowledge of the phenomena of the third stage of labour. He rejects the view that retroplacental hæmatoma plays an effective part in the separation and considers that this process follows more promptly on the birth of the fœtus than has been thought. But even if these physiological observations are accepted as accurate, the onus of proof for a change in our management of the third stage of labour lies with the author, and the case will be decided by the justification he can offer for vaginal examinations in the uncomplicated third stage. In almost 90 per cent. of the 1000 cases the placenta was delivered within five minutes of the fœtus, and in all but 24 cases within ten minutes. Manual removal was practised in two cases. The average duration of the third stage in the 1000 cases was 4·3 minutes. There is, therefore, no question that this practice may lead to a considerable shortening of the time of the third stage. That alone could scarcely justify Leff's claims; further reasons are given in a considerable reduction in loss of blood and, in consequence, of morbidity, and that the patient recuperates sooner. For these statements, however, no evidence is offered beyond that of a diagram showing the placenta obstructing the cervix, blood accumulating behind it, and no sign of bleeding externally; 267 cases showed bleeding before delivery of the placenta, while 733 gave no evidence of bleeding, from which it seems to be taken for granted that this blockage by the placenta, as shown in the diagram, occurred in nearly three-quarters of his cases. There is also a table giving the estimated loss before and after delivery; in 712 cases it was said to be slight (under 6 oz.); in 243 moderate (between 6 and 12 oz); in 41 considerable (up to 20 oz.); and in 4 profuse (over 20 oz.). There are no morbidity records, and no clear proof that the finger passed into the cervical canal can accurately determine all the points which Leff mentions, such as " where the placenta is located after separation," a knowledge of which he regards as essential to a proper technique in expression. He may have had success with his method, but before recommending it for general adoption he must show that his cases have at least no greater morbidity than those under the method hitherto found satisfactory. This gap deprives his contribution of much of the practical value it might otherwise have had

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[1] Amer. Jour. Obst. and Gyn., December, 1929, p. 868.

THE UNITY OF STREPTOCOCCAL TOXINS.

In the early days of streptococcal history—and so quickly has knowledge increased that one is apt to forget that its history began in the 'eighties—there was a tendency to believe that organisms recovered from different lesions in the body were each specific and distinct bacteria. The widespread nature of streptococcal infection threw doubt on this theory, and the swing of the pendulum led to the theory, still prevalent in France, that there was only one streptococcus. To-day opinion is half-way between these extremes. The animal streptococci, the fæcal streptococci, are held to be distinct strains. The hæmolytic strains differ from the non-hæmolytic, and the former are the more virulent organisms, though mutation from one form to the other occurs. But within the group of hæmolytic organisms are three well-known types associated with scarlet fever, erysipelas, and puerperal sepsis. It is urgently necessary to discover whether these are identical or separate, both from the point of view of the ætiology and prevention of the conditions, and of their serum therapy. The method by which serums are prepared may be all-important. The old type of serum employed for treatment of streptococcal infections was known as polyvalent antistreptococcal serum. It was made by injecting horses with suspensions of streptococci, and, therefore, was mainly an anti-*bacterial* serum; although some specimens may have chanced to contain a certain amount of *antitoxin* no attempt was made to induce the formation of it. On the other hand, the antiserum referred to in Dr. A. B. Rosher's article (see p. 129) is essentially antitoxin, prepared by the immunisation of horses with *toxin* produced by the scarlet fever streptococcus. In the preparation of this serum cultures of streptococcus are injected into the horses as well as toxins, so that it should have antibacterial properties as well as antitoxin ones. The problem is not easy to approach. Agglutination and cultural tests are indefinite, and perhaps inadequate, for the main question to be solved is that of the specific or non-specific toxin production of different strains. And the method mainly employed has been the skin-test technique of G. F. and G. H. Dick, although a few results with rabbits, and a recent paper in this journal by H. Burt-White,[1] on therapeutic effects of scarlet fever serum on puerperal sepsis have been recorded. Results are remarkably discordant. D. G. S. McLachlan[2] found erysipelas toxin to be neutralised by scarlet fever antitoxin. H. Burt-White found puerperal fever to be beneficially treated by scarlet fever antitoxin. G. F. and G. H. Dick,[3] however, recently published an elaborate analysis of the mutual action of erysipelas and scarlet fever toxins and antitoxins. They found no neutralising power whatever of non-homologous sera; moreover, individuals were frequently found immune to the one toxin, while sensitive to the other. Similar results have been obtained by other observers using strains isolated from the throats of rheumatic children. In all these cases human skin tests were used. Among other authorities who found results opposite to those of G. F. and G. H. Dick, are C. C. Okell and H. J. Parish,[4] who could find no distinction between any streptococcal toxins. Dr. Rosher, in the paper already referred to, has obtained remarkably successful results in four patients with septicæmia, blood cultures being positive in all cases. The identity of skin reaction with toxin is by no means proven. Since it is now established that concentrated toxin will kill laboratory animals, it would appear reasonable to use that method in differentiating the toxins. Our only specific means of dealing with streptococcal infection at present is with antitoxins. Their effect on animals is dramatic, in the neutralisation of toxin, and the prevention of death, or at any rate its prolonged delay, in infection with living organisms. If there is more than one toxin, we must look to serological laboratories for the appropriate antisera. And, since the only hope of any serum therapy lies in its earliest possible use, some rapid and certain method of recognising strains becomes essential. Meanwhile the practitioner who receives a report that a hæmolytic streptococcus has been recovered from the blood of a patient suffering from septicæmia will be wise if he injects scarlet fever streptococcal antitoxin in preference to antibacterial serum.

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[1] Burt-White, H.: The Lancet, Jan. 4th, p. 16.

[2] McLachlan, D. G. S.: Jour. Hyg., 1927, xxvi., 84.

[3] Dick, G. F., and Dick, G. H.: Jour. Amer. Med. Assoc., 1929, xciii., p. 1784.

[4] Okell, C. C., and Parish, H. J.: The Lancet, 1927, i., 71.

THE ÆTIOLOGY OF ERYTHEMA MULTIFORME.

Erythema multiforme (Hebra) takes a prominent place among the dermatoses which most authorities in England and America have accepted as examples of the effect of focal sepsis. The work of Rosenow on the variable toxicity of streptococci, and the clinical observations of Leslie Roberts and H. W. Barber in this country, have gone far towards establishing this hypothesis, but in practice it is found that extirpation of accessible septic foci is by no means always successful in preventing recurrences of the clinical manifestations, even when autogenous vaccines are associated in the treatment. A paper[1] just published by Prof. Edwin Ramel, of Lausanne, is of great interest in this connexion. He admits many of the contentions of those who argue in favour of a streptococcal ætiology; thus he agrees that sore-throat often precedes the eruption and that hæmolytic streptococci can sometimes be recovered from the lesions. But he quotes cases in which these organisms were not found, and claims that if erythema multiforme has a streptococcal cause the organisms should always be present in the skin, for they are always recoverable in the true streptococcides. The argument is not altogether sound, for there are undoubted cutaneous manifestations of syphilis and tubercle in which all efforts to find the virus in the skin have been fruitless. The phenomena of skin sensitisation are highly complex, however, and Ramel cannot accept a theory of special streptococcal susceptibility of the skin in erythema multiforme on the evidence at present available. He has attacked the problem —which in its salient features much resembles that of lupus erythematosus—in another way. Being convinced of the tuberculous origin of lupus erythematosus he was led to suspect a similar ætiology for erythema multiforme, and in four cases—previously unpublished—he claims to have demonstrated a "tuberculous bacillæmia at the period of eruption." His technique is briefly as follows. About 5 c.cm. of the patient's blood were injected into the subcutaneous tissues in the region of the left groin of two guinea-pigs. These animals seemed to show no signs of ill-health for three months after the inoculations, but necropsy then revealed a little enlargement of the local lymph-glands and some greyish gelatinous nodules in the lungs. A tissue extract from them was made into a second series of guinea-pigs, with a somewhat similar result after two and a half months. Yet a third series was then subjected to the same experiment, and in these the clinical evidence of tuberculosis was very strong, and the suspicion was amply confirmed by the microscopical demonstration of acid-fast bacilli in smears of tissue fluids from the various organs. A similar result was obtained in all four cases of the disease. In his commentary Prof. Ramel is careful to anticipate various criticisms to which his observations will give rise. The findings, he says, were unexpected even by himself, and he agrees that patients with erythema multiforme rarely, if ever, manifest any clinical signs of tuberculosis. The question of the validity of the method of successive inoculations and the possibility of "spontaneous" tuberculosis in his stock are discussed and balanced against the remarkable concordance of results in the four cases. It is claimed for tubercle that it explains the symmetrical distribution of the eruption, the occasional occurrence of fatal cases, and the sudden onset, sometimes after additional factors have been brought into play—such as erythema solare or an illness or septic condition. His theory would allocate to the streptococci the rôle of "agents provocateurs," rather than "origines malorum," and from the dermatological standpoint it is, to say the least of it, disconcerting. If confirmed it would profoundly modify current views on the ætiology of this dermatosis, and also (as the author himself observes) the present conceptions of the general pathology of tuberculosis.

REMOTE PROGNOSIS OF PNEUMONIA.

FOR many years it has been recognised that children who have had a long respiratory infection are extremely liable to develop pulmonary fibrosis and bronchiectasis, with distressing symptoms. This fact led Dr. H. P. Jameson[1] to investigate the after-history of children who had had pneumonia in the Hospital for Sick Children, Great Ormond-street, London, and in the Children's Hospital, Birmingham. Fifty-eight children whose illness had lasted more than three weeks were re-examined after a considerable interval, and of these 18 were found to be suffering from symptoms severe enough to make them lead a life of semi-invalidism. Those who had rickets as a complication at the time of their infection did worst, whereas even out of those 23 who had what the author calls an acute non-specific pneumonia (as opposed to one following measles or whooping-cough) four, or 17 per cent., had severe symptoms of pulmonary catarrh. This statistical study, small as it is, emphasises the problem with which the physician is frequently faced in an out-patient department. A child may be discharged from a ward having made an apparently satisfactory recovery from a prolonged bout of pneumonia, or may even return from a month's convalescence in the country, only to be found suffering from incipient bronchiectasis or a second attack of pneumonia. Dr. Jameson's experience should lead to a more serious consideration of these cases; strong efforts should be made to prevent the development of sequelæ, since the patients are likely to reach a stage of danger not only to themselves but to the other members of the families to which they belong. It is not improbable that if they were examined regularly in follow-up clinics that the proportion of children whose lungs are permanently damaged might be found even greater than that recorded by Dr. Jameson. An attempt should be made to reduce it by earlier recognition and treatment. It has long been a matter of regret that no sanatoriums are provided for chronic non-tuberculous cases, since much can be done by open-air treatment to minimise the damage done to the lung. These children benefit greatly by a visit to the country, and this benefit is often of long duration. Radiographic evidence supports the belief that the fibrous changes when present can be arrested. Unfortunately it is usually impossible for children of the hospital class to spend much time in the country. If their stay has to be limited, it is desirable that the winter rather than the summer months should be chosen for life in the country. As regards other treatment, ultra-violet ray therapy can be tried, and vaccines help to clear up the lung in a small proportion of cases. Almost without exception the adventitious sounds are heard at the bases of the lungs in these post-pneumonic patients. This in itself suggests mechanical treatment for their relief, and although it is early to judge fully of massage, it appears to assist in promoting convalescence. Many of our hospitals are trying out this comparatively recent innovation; Dr. Douthwaite and Miss Angore have given pulmonary diseases a prominent position among the indications for treatment by massage and gymnastics discussed in a recent paper.[2] They stress the importance of the expiratory part of respiration, and although they desire a large expansion they do not wish to gain it at the expense of the alveolar walls with risk of emphysema. It is essential to carry out exercises in such a posture that the patient has the assistance of gravity in helping him to expectorate the pent-up sputum. It is surprising with what speed youngsters will learn these exercises, and with what enthusiasm, according to their mothers, they will do them in their own homes. It is by these measures rather than by medicine that we can hope to prevent recurrences, which, as Dr. Jameson has shown, increase the chances of severe sequelæ to 50 per cent. There seems to be no definite criterion as yet whereby we may discover which among the non-pleurogenous patients is going to develop symptoms, and therefore it is wise to treat them all as potential cases of pulmonary fibrosis.

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[1] Brit. Jour. Derm. and Syph., January, 1930, p. 1.

[1] Jameson, H. P.: Archives of Diseases in Childhood, December, 1929, vol. iv., p. 365.

ALCOHOL AS AN ECONOMIC FACTOR.

Sir Josiah Stamp's lecture[3] to the Society for the Study of Inebriety will certainly do something to discourage facile statements on the economics of alcoholism. Most of us have lived too long to need his advice to be chary of believing all we are told about prohibition in America, but it is easy also to be misled by statistics from nearer home. For instance, one of the arguments against the brewing trade is that it finds employment for very few workers in comparison with the money it receives from the public. Sir Josiah quotes a plausible series of figures published by a temperance journal to prove this point, but remarks that they ignore those persons employed in distribution, in producing current materials, and in manufacture of articles necessary for repair and maintenance of the plant. Their inclusion, he says, would raise the numbers approximately to the standard given for other trades. Further, one has to consider the revenue obtained from the drink duty, which is used for the employment of persons in Government service. And the fact must be faced that under prohibition the loss of revenue to the country from this source would have to be supplied by increased general taxation.

Although it is extremely difficult, as Sir Josiah Stamp says, to arrange any experiment which will demonstrate the effects of removal of alcohol upon workers, uninfluenced by other factors, a large number of observations made under varying conditions must carry a certain amount of weight if their results tend to agree. To give an example from the United States, Prof. Feldman's questionaire on Monday and after-pay-day absenteeism produced, out of 287 replies, 184 reporting considerable improvement since the introduction of prohibition. Of these 184, 88 gave most of the credit to the Act, and 40 gave it part of the credit; 83 had had no problem of this kind before or since. Similar investigations on liability to industrial accidents brought 223 replies; 112 reported no change, 47 a large reduction chiefly or partly due to prohibition, 27 a small reduction, and 41 reductions due to other causes. Prof. Feldman, in summarising these results, says: "The most definite fact is that over a fourth credit prohibition with reducing accidents due to liquor, while not a single person asserts it made accidents more frequent." In Great Britain a progressive improvement in accident statistics has run pari passu with a decline in drink consumption, but the connexion is only inferential. With regard to the actual effect on industry, President Hoover in 1925 said that direct comparison of production efficiency before and after prohibition gave an increase of 10 per cent. in output. A firm of electrical engineers, who some years ago decided to run on total abstinence lines, averaged lost time at one-half of 1 per cent., where elsewhere in this trade the figure averaged 10 per cent.; and where returns for firms with 100,000 workers gave an average of 5 per cent. for lost time for sickness and accidents, this firm's figure was 1·4 per cent. Though none of these instances is definite proof of trade improvement due to removal of alcohol, their tendency is obviously in this direction. In discussing crime caused by alcohol, Sir Josiah gave it as his opinion that the economic cost of crime, as measured by the loss of productive output of the criminal, is not high. The number of persons leading a *life* of crime is comparatively small, and these, if successful, are seldom excessively alcoholic. Crimes due to alcohol are usually acts of impulse and violence, and the performers are commonly full producers as ordinary citizens. To the loss of production during imprisonment, which is relatively small, must be added the withheld products of the chronic alcoholics. He also distinguished between the actual loss to the country by absence of production, and the distribution for relief of these persons of funds which might be otherwise employed; this expenditure does not represent a loss of wealth, but only a maldistribution of wealth already produced. The only true loss is the loss of production on the part of persons incapacitated by alcoholism. There remain, however, the economic costs of dealing with criminals —expenditure on police, justice, gaols, &c.—and these are high.

In summarising his views on the effect that suppression of alcohol would have on economic output, Sir Josiah said: "The whole matter may be summed up by my saying that those who put the economic difference at less than 8 per cent., and those who put it at more than 15 per cent., both speak against the weight of the evidence."

MORE NEWS ABOUT DICHOTOMY.

A FORTNIGHT ago the *Newcastle Journal and North Star* gave its readers in Newcastle and elsewhere lurid tidings through the London correspondent of the paper who has reason to believe that a number of "Harley-street specialists" have developed the practice of giving general practitioners a portion of the fee charged to the patient. Further, he finds that "the Harley-street man . . . is confronted with a growing demand that he should return half the fee" to the general practitioner, whether or not he has personally attended the consultation or operation. This is described as a growing demand. We certainly ought to be scared by this picture, and assuredly we should be if our experience coincided with that of the writer of the paragraph. We should reflect that the general practitioner may become less rapacious or the specialist less pliable. Otherwise it would seem inevitable that the specialist will soon have to hand over the whole of his guineas to the recommending doctor, with the hope that the latter may be generous enough to refund him something. The London correspondent may infer correctly that consultant fees will be increased, but the increase will not be due to the situation which he suggests—namely, that the consultant is beginning to feel a shrinkage in his income, because if he will not pay the bribe no doctor will recommend him, while if he pays it his earnings may be halved. Impaled upon the horns of a dichotomy, such an one would deserve our pity, but the character belongs to fiction. Some time ago there was considerable discussion of the alleged practice of secret fee-splitting. Concerning its ethical and legal aspects there is no need to add anything to what is said of it in "The Conduct of Medical Practice." If, however, any member of the public in Newcastle or elsewhere now fears the worst, he may yet think it worth while first to await the production of more evidence than has hitherto been vouchsafed. If he believes that, next time he has occasion to use the services of a specialist, he will find the fees automatically doubled by some corrupt bargain on the part of his family doctor acting as his trusted agent, he might ask the latter to tell him the truth.

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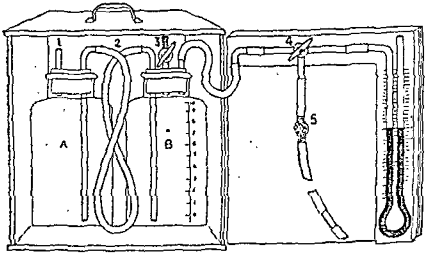
[2] Guy's Hospital Gazette, Dec. 14th, 1929, p. 493.

[3] Brit. Jour. of Inebriety, January, 1930, p. 1.

AN IMPROVED ARTIFICIAL PNEUMOTHORAX APPARATUS.

Of the various forms of apparatus used in artificial pneumothorax, the original Lillingston-Pearson still appears to be the simplest, cheapest, and most generally used. E. H. Stokes and A. J. H. Stobo,[1] by introducing some minor modifications, have made it simpler and more practical. They say that in the original apparatus the clips are unsatisfactory in that they are apt to become worn and to slip, thus allowing air-leaks to occur, and that there are too many of them. For the proper working of the clips, thin-walled rubber tubing is necessary, and in time it becomes flattened, tending to interfere with the flow of air. They also maintain that the arrangement of the tubing is clumsy. To overcome these disadvantages, and to make the apparatus more portable, they have arranged that the box (see figure) shall be 12 in. high, 9 in. wide, and 6 in. deep. A three-way glass tap (4) attached to the door of the box controls the air passing from the bottle (B) to the patient, and to the manometer. The manipulation of the air-flows is thus simplified, and the wings of the glass cock, on which is a small black dot, indicate the direction and patency of the air channels. If desired, the tap may be turned in such a way that all three channels are shut off, as shown in the diagram. In order to allow the refilling of bottle (B) with air, a glass tube packed with sterile wool and fitted with a two-way glass tap (3) has been inserted into the cork. Thick rubber tubing is used throughout. The authors say that they have used the modified apparatus in their work with complete success during the past five months.



We regret to announce the death of Sir George Dancer Thane, professor of anatomy at University College, London, from 1877 to 1919, and later a chief inspector for the Home Office under the Cruelty to Animals Act.

INDEX TO "THE LANCET," VOL. II., 1929.

The Index and Title-page to Vol. II., 1929, which was completed with the issue of Dec. 28th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of The Lancet, 7, Adam-street, Adelphi, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LIX.

SIGNIFICANCE OF THE BLOOD CALCIUM.

Part I.*

Calcium is essential to the normal metabolism of all living organisms. It enters the body via the food, is absorbed through the alimentary canal, exists at a more or less constant level in the blood stream, is stored in the bones, and is excreted via the urine and the fæces. While calcium has been used in some form or another as a therapeutic agent for a very long time, within recent years, following the development of the technique of blood estimations, a more definite rationale for treatment has been evolved. The metabolism of calcium is intimately related to that of phosphorus, and both play a prominent part in the growth of the organism. The study of the changes in calcium metabolism is thus important in many infantile disorders. Interest has been further roused in the metabolism of calcium through the preparation of an active parathyroid extract, which possesses the property of increasing the blood calcium even in normal animals.

In health the blood calcium content is remarkably constant—at a figure between 9 and 11 mg. per 100 c.cm. of serum. Evidence has accumulated to show that about 60 per cent. of the calcium in the blood is in a diffusible form and 40 per cent. is non-diffusible. This non-diffusible fraction is more fixed, and probably is combined with protein, while it has been shown that the diffusible portion supplies the free ionised calcium. Electrometric determinations have shown that the serum contains only about 2 mg. per 100 c.cm. of free calcium ions. Symptoms of calcium deficiency are present when the ionisation of this amount is impeded, and when the amount of the diffusible fraction is low. This has been the explanation put forward when a low total blood calcium is found in patients who do not show any signs of a calcium deficiency—that although the serum calcium in toto is low, the diffusible fraction is not affected in the same degree, and in consequence the active fraction is within the normal range of 2 mg. On this view no dogmatic statement can be made, for the technical difficulties in determining the accurate proportion of these two fractions in the blood serum are such that sufficient analytical data have not been produced. Until more reliable and easier methods come into general use, views upon these diffusible and indiffusible fractions have to be accepted with limitation.

The ordinary estimation is performed on the blood serum, a quantity of 2 c.cm. being sufficient. The principle of the method is the precipitation of the calcium as calcium oxalate by the addition of a known amount of ammonium oxalate. This precipitate is freed of all excess of ammonium oxalate by washing with ammonia and then dissolved in sulphuric acid. The oxalic acid liberated is then titrated with a dilute solution of potassium permanganate. The method is reliable, and yields in experienced hands very constant results.

Factors which influence the calcium metabolism and the level of serum calcium are the amount of calcium ingested with the food, the amount of calcium absorbed through the gut, and the proper control exerted by the secretion of the parathyroid gland. Undoubtedly there are other factors, but it is well known that when the food ingested is free of calcium tetany occurs and the blood calcium falls. It is also a fact that in rickets there is a great loss of calcium in the fæces, and it is believed a deficient absorption from the intestines, with a corresponding low value of calcium in the blood serum. Again, when the secretion of the parathyroid gland is absent, low calcium values are observed, and symptoms of calcium deficiency are manifest. Provided therefore that the diet is adequate in calcium, that the alimentary tract is able to absorb a sufficiency, and that there is no defective function of the parathyroid glands, it appears that the blood calcium will be at a normal value, and no signs of calcium deficiency observed. There are one or two reservations to this statement, for exceptions are seen. The ratio $\frac{\text{Na}+\text{K}}{\text{Mg}+\text{Ca}}$, first pointed out by Loeb, which draws attention to the opposite effects of the two groups of elements, may explain how symptoms resembling a calcium deficiency may be present and yet the calcium be found to be within normal limits. If the sodium in the serum is increased at the expense of the calcium signs of tetany may occur, as is seen when sodium phosphate is given to cases of latent tetany; when whey supplants milk in the infant's dietary, electrical hyperexcitability may be demonstrated, although the blood calcium be found at a normal level. The high Na content of whey is regarded as being the factor disturbing the balance of $\frac{\text{Na}}{\text{Ca}}$ and resulting in a latent tetany. Again, it often happens that a low blood calcium is encountered in cases which do not show any active or latent tetany; such examples are found in nephritis, renal rickets, and the adult form of uræmia. The explanation offered for this apparent anomaly is that a state of acidosis exists, and any process which tends to produce an acidosis increases the ionisation of calcium—so that although the total calcium value may be low the ionised fraction is within the normal limits. Any reverse state such as alkalosis produced by the ingestion of excessive doses of bicarbonate, persistent vomiting of acid juice, or hyperventilation of the lungs (with washing out of CO_2), may result in tetany, but with no diminution of serum calcium. The explanation offered here is that the ionisation is impeded by the alkalosis present. Although no definite proof has been produced, this dependence of ionised calcium on the acid-base equilibrium is interesting, and certainly furnishes a more complete explanation of the various types of tetany.

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[1] Med. Jour. Australia, Nov. 2nd, 1929, p. 610.

* Part II. will appear next week.

Hypocalcæmia.

Any value of blood calcium below 9 mg. per 100 c.cm. is regarded as within the pathological range. Rarely does the value fall below 4 mg. Symptoms are frequently present when a value below 8 is obtained, and almost invariably when the calcium is less than 6 mg. per 100 c.cm.

Tetany.—The main disturbance and most obvious in all conditions in which there is a fall of calcium, acute or chronic, is that called tetany—the name given to the clinical condition in which hyperexcitability of the neuromuscular apparatus is the essential basis. All gradations of severity from the acute form with convulsions to the mild and latent, with only an increased irritability to galvanic stimulation, are encountered. In the acute form the calcium may fall to a level of 5 or 4 mg., but when the condition has existed for some time, although the calcium may still remain within the low range, the symptoms of active tetany are absent. It seems that the body is able in time to adjust itself to this abnormal level, although active tetany may be precipitated by œstrus in dogs and menstruation in human subjects; pregnancy is certain immediately to convert a latent into an active tetanic state. This hypocalcæmia can always be relieved by the administration of calcium salts, either rapidly by the intravenous route or more slowly by the ingestion via the alimentary canal.

The conditions in which hypocalcæmia is found are spasmophilia, rickets, renal dwarfism, cœliac disease, osteomalacia, parathyroidectomy, and renal disease. These conditions, and also that of hypercalcæmia, will be considered next week.

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Previous articles in this series are:—

THE LANCET, 1928, Vol. II.: I.—Widal or Agglutination Reaction with Diagnosis of Infections due to Enteric Group of Micro-organisms, by Dr. A. B. Rosher (p. 461). II. and III.—Reports on Swabs from the Throat and Nasal Passages, by Dr. J. E. McCartney (p. 514 and p. 565). IV. and V.—Reports on Sputum, by Dr. S. Roodhouse Gloyne (p. 614 and p. 667). VI. and VII.—Reports on the Cerebro-spinal Fluid, by Dr. G. J. Greenfield (p. 716 and p. 770). VIII.—Significance of Hearing Tests, by Mr. Harold Barwell (p. 830). IX. and X.—The Blood Count, by Dr. S. C. Dyke (p. 936 and p. 988). XI.—The Arneth or Polynuclear Count, by W. E. Cooke (p. 1040). XII. and XIII.—Tests of Renal Efficiency, by Dr. G. A. Harrison (p. 1092 and p. 1143). XIV. and XV.—Determination of the Presence and Significance of Reducing Substances in Urine, by Prof. E. C. Dodds (p. 1200 and p. 1255). XVI.—Chemical Examination of Fæces, by Dr. J. H. Ryffel (p. 1353).

THE LANCET, 1929, Vol. I.: XVII.—Breast Histology, by Sir G. Lenthal Cheatle (p. 37). XVIII.—The Wassermann Reaction in Children, by Dr. David Nabarro (p. 90). XIX.—Blood-sugar Estimations, by Dr. George Graham (p. 201). XX. and XXI.—Significance of Ocular Tests, by Mr. R. Affleck Greeves (p. 249 and p. 298). XXII.—Clinical Significance of the Blood-urea Content, by Dr. O. L. V. de Wesselow (p. 353). XXIII. and XXIV.—The Electrocardiogram, by Dr. Crighton Bramwell (p. 409 and p. 459). XXV.—Reports on Material Curetted from the Uterus, by Mr. Thomas G. Stevens (p. 515). XXVI.—Albuminuria, by Dr. J. C. Spence (p. 623). XXVII. and XXVIII.—Significance of Organisms in the Urine, by Dr. Lionel E. H. Whitby (p. 788 and p. 837). XXIX.—Basal Metabolism Tests, by Dr. Leslie Cole (p. 937). XXX. and XXXI.—Clinical Significance of the Blood-platelets, by Dr. W. Cramer and Dr. R. G. Bannerman (p. 992 and p. 1048). XXXII.—Pyelography, by Mr. J. B. Macalpine (p. 1160). XXXIII.—Pleural Fluids, by Dr. L. S. T. Burrell (p. 1209). XXXIV. and XXXV.—Mental Tests, by Dr. H. Herd (p. 1317 and p. 1369).

THE LANCET, 1929, Vol. II.: XXXVI. and XXXVII.—Charts of Fractional Test-meals, by Dr. T. Izod Bennett (p. 35 and p. 82). XXXVIII.—The Schick Test, by Dr. R. A. O'Brien (p. 241). XXXIX.—The Dick and Schultz-Charlton Tests, by Dr. R. A. O'Brien (p. 296). XL.—Examination of the Blood for Bile-pigment, by Dr. John H. Anderson (p. 346). XLI.—Cholecystography, by Dr. John H. Anderson (p. 400). XLII. and XLIII.—Significance of the Acid-base Balance in the Blood, by Dr. John R. Marrack (p. 512 and p. 569). XLIV. and XLV.—The Wassermann Reaction in Adults, by Dr. T. E. Osmond (p. 624 and p. 677). XLVI. and XLVII.—Microscopic Examination of Fæces, by Dr. S. W. Patterson (p. 727 and p. 785). XLVIII.—Diagnosis of Gonorrhœal Infections in the Male, by Dr. A. B. Rosher (p. 836). XLIX.—Urethral and Vaginal Discharges, by Mr. Frederick Roques (p. 890). L.—Microscopic Findings in Dermatology, by Dr. H. C. Semon (p. 940). LI.—Tests of Sterility and Fertility in the Male, by Mr. Kenneth Walker (p. 995). LII. and LIII.—Diagnosis of Acute Food Poisoning, by Dr. William G. Savage (p. 1054 and p. 1107). LIV., LV., LVI., LVII., and LVIII.—Radiograms of the Alimentary Tract, by Prof. A. E. Barclay (p. 1158, p. 1210, p. 1272, p. 1322, and p. 1377).

The Services.

ROYAL NAVAL MEDICAL SERVICE.

New Year Promotions.—Surg. Comdrs. to be Surg. Capts.: F. J. Gowans, L. Warren, and S. F. Dudley.

Surg. Rear-Admiral R. W. Basil Hall, who is relieved at the Admiralty by Surg. Capt. G. L. Buckeridge, is appointed in charge of Plymouth Hospital in succession to Surg. Rear-Admiral R. St. G. S. Bond.

Surg. Comdr. J. Bourdas is placed on the Retd. List with the rank of Surg. Capt.

Surg. Comdr. R. F. P. Cory is appointed to *Victory* for R.N. Hospital, Haslar.

ROYAL ARMY MEDICAL CORPS.

REGULAR ARMY RESERVE OF OFFICERS.

Capt. J. A. W. Ebden relinquishes his commn. on appointment to a permanent commn. in the Ind. Med. Serv.

INDIAN MEDICAL SERVICE.

Capt. J. H. Barrett to be Maj.

ROYAL AIR FORCE.

New Year Promotions.—Squadron Leader T. J. Kelly to be Wing Commdr.

Flight Lt. Maurice O'Regan is transferred to the Reserve, Class D (ii).

COLONIAL MEDICAL SERVICES.

Dr. G. C. Strathairn, Senior Sanitary Medical Officer, Jamaica, has been promoted to Director of Health, Cyprus.

Public Health Services.

ANTI-TUBERCULOSIS WORK IN THE COUNTY OF LANCASTER.

Dr. G. Lissant Cox's report for 1928 shows clearly that the medical staff of the county are alive to the need for research into the prevention and treatment of tuberculosis, especially research for which a large county area provides exceptional facilities. The county council have encouraged the tuberculosis medical service to give trials to the various new methods of treatment which are, from time to time, recommended as "cures" for tuberculosis, provided, of course, that there are patients prepared voluntarily to coöperate. A sum of £200 per annum has been voted for the purpose, and since the resources of the county scheme (services of staff, use of premises, laboratory facilities) are available without charge against the research fund, and new preparations are often offered for trial free of charge, the sum has gone a long way.

In addition to testing new remedies, the medical staff have analysed the histories of 1486 children under five years of age, living in 1003 homes, in each of which there were one or more adults suffering from tuberculosis. There was no selection of cases by tuberculosis officers, and no undue proportion from any particular area or areas. Of the children dealt with in this research, the substantial majority remained, throughout their period of observation, in constant contact with an adult tuberculous case in their homes, after allowing for those adults who received several months institutional treatment and for a small number of children who were removed for varying short periods to the homes of relatives. The death-rate from non-pulmonary tuberculosis of children exposed to risk in tuberculous households from an adult with positive sputum was found to be greatly in excess of the general rate from the same cause in the county—nine times greater in the age-group 0–1, 14 times greater in the age-group 1–2, and 19 times greater in the age-group 2–5. This great excess of non-pulmonary tuberculosis was mainly due to deaths from tuberculous meningitis which accounted for two-thirds the mortality in the non-pulmonary group, ages 0–5.

Similarly (although statistically insignificant owing to the probable error due to chance) the death-rate from non-pulmonary tuberculosis of children exposed to risk in tuberculous households with an adult case or cases suffering from pulmonary tuberculosis with negative or no sputum, was also in excess of the rate from the same cause among children in the county, the rate being three times greater in the age-group 0–1, four times greater in the age-group 1–2, and ten times greater in the age-group 2–5. The number of deaths from pulmonary tuberculosis of children exposed to risk in tuberculous households was too small to justify any conclusion. The mortality-rate from tuberculosis was greater amongst the children of tuberculous positive sputum mothers than fathers. It seems that Calmette's calculation, that in France 24 per cent. of the children of tuberculous mothers die from tuberculosis in the first year of life if left with the mother is many times higher than the Lancashire experience. The latter shows that the death-rate from tuberculosis for corresponding Lancashire children was 3·2 per cent.; from all causes the rate was only 11·5 per cent. Further, the Lancashire investigation shows for children observed from birth to four years of age a death-rate, from tuberculosis and from all causes, a little lower than the French figure for children observed from one month to four years vaccinated with BCG; and much lower than for the French children unvaccinated with BCG.

Taking a period covering the whole first five years of life, those children who were in contact at home with an adult person suffering from pulmonary tuberculosis (whether sputum positive or negative) did not have a *higher mortality* from *all* causes when compared with the expectation of life of children in England and Wales. Full details of this work are embodied in a special report, issued by the county, which was also reprinted in *Tubercle* for August of last year.[1]

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some 1928 statistics of nine districts, varying in local government status:—

Name of district and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Bolton C.B. . . (181,200)	14·3	12·8	0·77	1·35	2·4	1·7	64/26	37	3·1
Kensington M.B. . . (178,200)	14·3	13·0	0·74	1·78	1·9	2·4	83/27	49	2·7
Willesden U.D. (176,589)	15·1	9·8	0·71	1·36	1·5	1·6	57/27	27	3·7
Isle of Ely County . . (77,780)	19·3	11·7	0·92	1·80	1·5	1·9	59/—	25	4·0
Cambridgeshire . . (72,440)*	15·5	12·6	0·76	1·85	1·5	2·2	62/—	15	5·3
Cambridge B. . (60,860)	12·8	10·9	0·80	1·74	1·6	1·3	55/29	23	2·6
S.-W. Kent United Health Area . . (81,756)	14·0	12·6	0·77	1·90	1·4	2·4	48/—	—	0·9
Chesterfield R.D. . . (85,000)	21·0	10·0	0·76	1·06	1·6	1·2	76/—	—	3·3
Hereford R.D. (13,320)	16·6	11·0	0·75	1·05	1·5	2·0	36/18	—	4·5

* Excluding Borough of Cambridge.

Relation of stillbirths to live births: Kensington 2·6 per cent. (N.). Willesden, 3·5 per cent. (R.). Cambridgeshire, 2·6 per cent. (N.). Cambridge, 4·6 per cent. (N.).
N. = notified. R. = registered.

Bolton.

Dr. C. W. Paget Moffatt shows that the infant mortality-rate was ten less than it has ever been before in Bolton, and that the neonatal rate, which is usually high in Bolton, was also lower than ever before. The rate for the latter (26) may be compared with an average rate of 39 for the ten years 1918–27. The maternal mortality-rate was also comparatively satisfactory. The Haslam maternity home (18 beds), a fine building situated in pleasant and extensive grounds and presented to the town by the late Mr. J. P. Haslam, is much appreciated. Over 300 cases were admitted for confinement, and all expectant mothers on the admission list attend the antenatal clinic, except those who are having antenatal care from their own doctor. Another municipal antenatal clinic was attended by 130 patients, the total number attending both clinics being 444, whilst the births numbered 2593. Dr. Moffatt is of opinion that, according to Bolton experience, the recent apparent increase of cancer in females is confined to growths in inaccessible sites, and that most of the apparent increase in males is also due to more accurate diagnosis.

The Bolton corporation now own the whole of the gathering grounds of their water-supply, and all but five of the farms thereon have now been evacuated, and arrangements have been made to deal with the remainder during the course of the next few years.

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[1] See also THE LANCET, 1929, i., 1201.

Bolton still has 2816 pail-closets and 1840 privy middens needing conversion or demolition. Of the 43,000 water-closets, 15,000 are of the "waste-water" type. The permissible limit for black smoke is two minutes in the half hour but bursts of dense black smoke for periods of less than 30 seconds are not counted. Dr. Moffatt states that no stricter standard is adopted in the Manchester area. In Sheffield, however, the limit for a chimney serving one boiler furnace is two minutes in an hour's observation, with no exception for short bursts, and apparently the Bolton chimneys had no difficulty in conforming to their more lenient standard, as out of 642 half-hour observations there was only one emission exceeding two minutes. The number of new houses erected dropped from 1081 in 1927 to 479 in 1928. Out of the 479 there were 416 subsidy houses, 160 municipal, and 256 by private enterprise. In order to facilitate the clearance of slum areas, Dr. Moffatt suggests that houses might be built in a central position, to be tenanted in turn by the inhabitants of the various slum areas during the period of reconstruction, and also that poor class property might be purchased, renovated, and used in the same way. At the time of writing, by-laws for houses let in lodgings urgently needed are awaiting the approval of the Ministry. The charges made for these rooms are "in many cases grossly exorbitant," and the amenities provided are "miserable." Dr. Moffatt would also like to see two-roomed dwellings provided for childless elderly married couples or married couples whose children have left them, as such people are an important factor in the slums, whose needs are not catered for by private enterprise. There are 129 cow-keepers in the borough, and the cows kept number 2725. One farmer has a licence to produce Certified milk. During the year five cows were found to be giving tuberculous milk and were dealt with under the Order. One farmer was fined £10 for failing to notify a cow suffering from tuberculosis of the udder.

There were 13 notifications of encephalitis lethargica and 11 deaths; 3 of the patients who died had not been notified. Dr. Moffatt comments on the lack of suitable provision for the after-effects of this disease. There were 840 notifications of scarlet fever with 1 death; 465 were admitted to hospital, "where all cases which are not quite definitely mild receive the scarlet fever antitoxin, the effects of which are really wonderful." There was no death in hospital, but an unusual number of cases of otorrhœa, and Dr. Moffatt thinks such complications of scarlet fever are apt to occur in cycles. Dr. Mary Boullen, who conducts the light clinic, found that long-continued attendance, with moderate exposures, gave better and more permanent results than attendance over a short period with more rapidly increasing exposures. She thinks that, taking everything into consideration, the clinic continues to justify its existence, and that the mothers who attend regularly are appreciative of the improvement in the condition of their children and are satisfied with the results of treatment.

Kensington.

Dr. James Fenton reports that the rheumatism supervisory clinic, established towards the end of 1927, has made good progress. A report on the first year's working, published as a separate document, shows that much research has been initiated, both from the environmental and the clinical points of view. There were 159 notifications of acute rheumatism during the year ended Oct. 1st, 1928, and of these 81 were seen at the centre, in 8 of whom the diagnosis was not confirmed, and in 6 of whom it was doubtful. A series of 200 cases has come under review, and the study of the prevention of relapses has made a good start. Dr. R. C. Lightwood, who is in charge of the clinic, was granted six months' leave of absence in order to undertake special work at another hospital, and his position has been temporarily filled by Dr. Francis Bach. The comprehensive municipal tuberculosis scheme has not been materially altered since it was adopted seven years ago, and includes among its features a very representative "care" committee and efficient arrangements for following up suspects and contacts. Dr. Fenton is able to report that the decline in the death-rate from tuberculosis still continues. During the first three years of the last decennium the death-rate per 100,000 from all forms of tuberculosis was 131, 109, and 105; during the six years, 1922–27, the rates were successively 95, 85, 83, 89, 89, and 80, and during 1928 the rate for the first time got into the seventies.

An unsatisfactory feature of 1928 was the rise in the infant mortality-rate from 68 in 1927 to 83. Dr. Fenton attributes this rise very largely to measles, to an increase in premature births, and to an increase in illegitimate births. Since the war the three years with the highest infant mortality—namely, 1921, 1925, and 1928—have been those with the highest number of illegitimate births. Kensington includes a large population of unmarried women, and in the southern half there are two female for every male elector. There is a large number of unmarried female shop-assistants and domestic servants. In 1928, 9·4 per cent. of the births in Kensington were illegitimate, and accounted for 23 per cent. of the infant deaths. Out of the total of 213 infant deaths, 52 occurred in the first week of life, and 70 in the first four weeks; whilst out of the deaths of the 51 illegitimate children 17 died in the first week and 31 in the first four weeks. In 1928 there were 2559 births in Kensington, and it is estimated that 443 occurred in families financially outside the scope of the council's M. & C.W. scheme. In respect of the remaining 2116, 1456 of the expectant mothers attended the special antenatal clinics held at Queen Charlotte's Nurses' Home and other institutions. This means that 70 per cent. of the expectant working-class women receive antenatal treatment, but Dr. Fenton is not satisfied with this percentage, and expects to increase it. Dr. Remington Hobbs, the borough's consultant gynæcologist, has accepted the duty of investigating for the Ministry every case of puerperal fever and each maternal death.

Pneumonia and broncho-pneumonia, mainly associated with the widespread outbreak of measles at the beginning of the year, were responsible for 59 infant deaths. The heaviest incidence of the London outbreak of paratyphoid fever was felt in Kensington, where 66 cases were notified between July 25th and Sept. 1st. Only one death was attributed to this cause during the year. During the course of the epidemic statements appeared in the press that if the addition of boric acid to cream had still been permissible the epidemic might not have occurred. Dr. Robert Donaldson, the bacteriologist to the borough council, carried out tests from this point of view, and found that even when 4 per cent. of boric acid was added to cream the growth of paratyphoid B in it was not prevented, and 4 per cent. of boric acid is ten times more than the maximum allowed in cream prior to Jan. 1st, 1928.

The Kensington housing problem presents many special features. Thus there are 2091 mews dwellings, and 5690 houses let in lodgings, occupied by several families, instead of by one as originally intended, whilst fortunately the most unsatisfactory form of dwelling—the houses let in furnished rooms—has been decreased from 187 in 1912 to 34 at the end of 1927. There are also 13,000 basements used for dwelling purposes, with ceilings at or below the street level in 640 cases. Unsatisfactory common lodging-houses for women have been closed, and better accommodation provided by private philanthropy and voluntary associations. The council have built about 600 houses and flats, and arranged for the removal of 674 families to the L.C.C. Wormholt Estate, adjacent to N. Kensington. Many trusts have provided blocks of dwellings managed on the Octavia Hill system. Dr. Fenton is able to record great efforts made by the coöperation of the borough council and voluntary housing associations. Cases of overcrowding are becoming less numerous and less difficult to deal with. He points out that legal standards of habitability are necessarily low, and that all is not satisfactory. For example, with few exceptions, the 13,000 basements comply with the legal standards for underground rooms, but nevertheless damage to health must result from thousands of people in Kensington having no living or sleeping rooms other than in basements. Even if new legislation were secured to close the most undesirable of these basements, it could only be enforced very gradually in the absence of accommodation for the persons displaced either in Kensington or outside.

Willesden.

Dr. George F. Buchan mentions that early in the year a large electric generating station extended the use of pulverised coal for steam raising, and that within a short time numerous complaints were received from householders and business establishments as to a serious nuisance from the emission of grit. Observations were made and the grit deposited in trays in the neighbourhood of the works was collected and weighed. As the result of a conference, the company installed grit-arresting and water-screening apparatus, which has lessened the nuisance, but it has been ascertained that another company is about to instal another plant for using pulverised fuel. Immunisation against diphtheria was adopted for the hospital staff in 1926 with satisfactory results, and in May, 1927, Dr. A. G. Troup, the medical superintendent of the municipal hospital, was authorised to offer immunisation at one of the clinics. The bulk of the work in 1928 consisted in establishing the results of the 1927 immunisations, while the advent of fresh cases was disappointing. It is thought, however, that the result of the first year's immunisations will stimulate interest.

Dr. H. Haldin Davis, in his report on the artificial light clinic, shows that many of the patients suffered from vague ill-health, 81 being classed as general debility and malnutrition, and 28 as pretuberculous. Treatment in these cases had satisfactory results, as also in asthma, rickets, and septic skin conditions. The work is handicapped by being carried out "in a draughty underground room of scanty dimensions." Dr. Agnes H. Nicoll, on information from all available sources, concludes that the Willesden school entrant of the last two years has begun school life in much better physical condition and more healthily clad than in 1907. The defects of throat and nose are less grave in degree than formerly, but the condition of the teeth is still far from satisfactory. Functional derangements of the nervous system have not noticeably changed for the better, and the entrant has failed to regain the pre-war level in nutrition. Dr. Bessie R. Mackenzie reports on antenatal work, the first clinic having been established on Nov. 1st, 1916. She describes the essentials of a clinic, and states that it "should be in charge of a competent medical officer—preferably one who has had considerable practical experience in midwifery." One feels that the words "preferably one" should have been omitted. Dr. Alice J. Gray reports on maternal mortality and morbidity in Willesden, 1919–28. During this period there were 123 deaths from childbearing—a maternal mortality-rate of 4·1 per 1000 births. The primary causes of deaths were: sepsis 51, toxæmia 17, hæmorrhage 14, abortion 13, thrombosis and embolism 7, abnormal labour 6, and other causes 15. Of the 13 fatal abortions 3 were criminally induced. The sinister effect of illegitimacy is shown in a table. Thus, during these ten years, for 29,413 legitimate births, there were 115 maternal deaths—a rate of 3·9. Whilst for 962 illegitimate births there were 8 maternal deaths—a maternal mortality of 8·4. In 102 of these fatal cases 33 of the babies were born prematurely, and in 20 of the 123 the baby was stillborn. As regards morbidity, the health of 13,012 mothers attending the Willesden clinics during the 12 months following delivery was investigated, and some morbid condition was noted in 42 per cent. The commonest morbid conditions found were: white-leg, 10 per cent.; breast abscess, 17 per cent.; prolapse, 14 per cent.; perineal tears needing operation, 11 per cent.; and varicose veins, 9 per cent.

Isle of Ely.

Dr. R. French, who presents the report, took over his duties during 1929. The Isle of Ely chiefly uses resident institutions outside the county. Thus five cases of difficult labour were treated at Addenbrooke's Hospital, where also the most used V.D. clinic is held; and 64 tuberculosis patients were sent by the county council to 12 different sanatoriums and hospitals. Great difficulty is experienced in finding institutional accommodation for the various grades of mental defect. About 70 samples of milk are analysed every year, and a curious variation in the average percentage of fat is disclosed. Thus the average fat percentage for 1925 was 3·8, for 1926 3·5, for 1927 3·67, and for 1928 3·85. Items from the districts include: complaints of river pollution by sewage and beet-sugar effluent (Ely U.D.); satisfaction at the relief of unemployment by the sugar-beet factory (Ely R.D.); pollution of the Nene by gasworks washings (March U.D.), and the clearance of a slum area (Wisbech borough). The fruit pickers in Wisbech R.D. are reported to be well housed, and their allotted quarters are inspected just before occupation. A case of encephalitis lethargica was landed from a ship in Wisbech port, and died within a few days.

Cambridgeshire.

Dr. Frank Robinson's report shows that provision for maternity cases was improved by the opening of two new maternity wards to accommodate eight patients in Addenbrooke's Hospital. The county council, however, are still anxious to arrange with the hospital for the provision of a 20-bed maternity home, with an antenatal clinic attached. The council paid for the maintenance of 28 mothers, including sepsis cases, at Addenbrooke's, and also maintained four unmarried mothers at the Ely Diocesan maternity home. In connexion with the latter a babies' home has been recently opened for the reception of infants whose mothers have obtained situations in the neighbourhood. All the 50 midwives who practise in the administrative county are trained women, and through the agency of the County Nursing Association, which is subsidised by the county council, the number of rural parishes without the services of a nurse-midwife has been reduced to 10, with a population of 5738. The county council, having no institution of their own, maintain mental defectives at about 20 outside institutions. A joint scheme with Essex and West Suffolk for adding 34 places to the accommodation has been mentioned since 1924, but has not yet materialised. The county council are of opinion that the public is misled into thinking that Grade A is the highest standard of milk, and ask for the support of all county councils in favour of the alteration of the designations. The only action taken under the Housing (Rural Workers) Act was by Linton R.D.C., which made grants in respect of 16 cottages, all of which were successfully reconditioned.

Cambridge.

Dr. Andrew J. Laird shows that 16·9 per cent. of the births and 29·2 per cent. of the deaths took place in institutions. During the last five years about one-third of the infant deaths have been due to premature birth, and about one-fifth to bronchitis and pneumonia. During the same period there have been five maternal deaths from sepsis and two from other puerperal conditions, giving a maternal death-rate of 1·2 per 1000 births from sepsis, and a total rate of 1·7 from childbirth. Mr. W. B. Grandison's scheme for the dental treatment of mothers and children under the school age continues to grow. Apart from the encouragement of breast-feeding, the essentials laid down by Mr. Grandison are mainly mechanical—e.g., washing the baby's mouth with dilute boric after each feed; the abolition of the dummy and of thumb- and finger-sucking; and the provision of something hard to chew at. After the child has cut four teeth the essentials laid down are: its enrolment in the dental scheme; the purchase of a toothbrush and its use after each meal; the provision of a tooth-cleansing food after each meal; and the bringing up of the child to the clinic every six months. Mr. Grandison states that if these instructions are carried out every child should reach school age free from dental disease. The number of children in their fifth year enrolled in the scheme were 197, and a table shows that they had 3280 sound, 472 decayed but saveable, and 95 decayed and unsaveable teeth. Further, 25 permanent molars had erupted at this age, of which nine were decayed but saveable. Mr. Grandison does not mention whether he is satisfied with these results, but there are no controls outside the scheme. Possibly Oxford might start an opposition experiment founded on the work of Mrs. Mellanby, and giving attention to the food needed for building good teeth rather than to the mechanical side. It is surprising that the choice of tooth-building food should have been ignored in the British mecca of vitamins. The pioneer effort of the Cambridge Housing Society in reducing rentals for large families has made progress. This society has built 45 houses, which are occupied by 45 families, including 200 children. The rents without rates are 7*s.* to 7*s.* 6*d.* a week, with a deduction of 6*d.* a week for each child of school age, down to a minimum rent of 5*s.* per week. The accommodation consists of two living rooms (one being the kitchen), three bedrooms and a bathroom, and a good garden. The society has been encouraged by the results to purchase a new site for the erection of 16 more houses.

South-West Kent.

Dr. S. Nicol Galbraith shows that five isolation hospitals treated during the year 444 cases, and that two small-pox hospitals treated one case. There would, therefore, seem to be room for the pooling of accommodation. There is still a shortage of houses. Tonbridge has 200 applicants on its waiting list, and there is a great shortage at Marden in Maidstone R.D. The position is aggravated by well-to-do people buying old picturesque labourers' cottages, and modernising them for week-end cottages. The administration of the by-laws for hop-pickers has made much demand on the department. Some 60,000 Londoners arrive annually for the hop-picking, and in addition thousands of visitors by train and char-à-banc. Although the arrangements have been improved, there is still need for more careful attention to cleanliness, sanitation, scavenging, and especially to water-supply. Dr. Galbraith gives a photograph of what was a common occurrence during the dry season of 1928—the scene of wreckage left by the burning of huts. More care is needed with regard to the lighting of the huts and to the use of gypsy fires. Three children were burnt to death in 1928. One family brought down a child diagnosed as chicken-pox in London. This led to two cases recognised as small-pox at Marden, which were removed to the M.A.B. hospital. Dr. Galbraith thinks that as this invasion of Kent for three weeks is not like an ordinary holiday problem, the London hospitals should take charge of the infectious cases which arise in the camps. If sanitation were reasonably good, one would expect fewer cases of infectious disease to develop among the 60,000 Londoners while they occupy the camps and lead an open-air life, than if they had lived at home for this period. The infectious cases which developed amongst the immigrants were, whilst picking, diphtheria 7, scarlet fever 3, and small-pox 2; and on return to London: diphtheria 5, scarlet fever 9, small-pox 8, and paratyphoid 1.

Chesterfield Rural.

Dr. Herbert Peck says the crying need of his district is the conversion of privies to water-closets, which is dependent upon another need—that of an improvement in the water-supply. At present much of the water in the gathering grounds of the Northern reservoirs goes to waste owing to the shortage of reservoir accommodation. Additional works are now in course of construction, and the principle of the formation of a joint water board with neighbouring districts has been approved. Coal-mining with quarrying gives employment to nearly half the occupied males in the district.

Hereford Rural.

Dr. R. Wood Power says the industries of the district are almost entirely of an agricultural nature. Hops and fruit are largely grown, and there is extensive breeding of Herefordshire cattle and dairying. Much work is in progress under the Milk and Dairies Order. A detailed report has been made of the premises of 200 applicants for registration, and in only 19 instances did the premises comply with regulations. Existing buildings have been successfully dealt with at 100 farms; 8 new cowsheds have been erected and 22 cooling and milk rooms. Photographs of the cowsheds, before and after alterations, illustrate in a striking manner what can be done by gutting the main structure and providing concrete mangers, floors, and channels, metal stall partitions, and better lighting. Arrangements for hop-pickers are much improved since the by-laws came into force in 1909. About 2500 pickers come from outside the county to 22 farms, as few as 6 going to one farm and as many as 700 to another. They are accommodated in barns, stables, cowsheds, and other outbuildings, and also increasingly in specially erected buildings. Some farms have canteens, but in most cases fresh meat, fish, &c., are supplied from tradesmen's vans, visiting periodically. Illustrated posters supplied by the Health and Cleanliness Council have had a good effect.

The District Council has been made the authority under the Housing (Rural Workers') Act, but, in spite of press notices and the circulation of leaflets, has only had two applications, both of which were withdrawn.

Corrigendum.—In our summary last week (p. 103) of Dr. J. Middleton Martin's report for Gloucestershire, the omission of a sentence at line 45, col. 2, made it appear that the remainder of the paragraph referred to the scheme for the extension of medical services, whereas it actually refers to the totally distinct orthopædic scheme. The work done for the former, in fact, included 12,864 attendances at out-stations and 1515 attendances at hospitals, total 14,379, as compared with a total of 11,460 in the previous year—with a corresponding lessening of the cost per attendance.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 4TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 248; scarlet fever, 2904; diphtheria, 1695; enteric fever, 38; pneumonia, 1455; puerperal fever, 51; puerperal pyrexia, 97; cerebro-spinal fever, 10; acute poliomyelitis, 6; encephalitis lethargica, 10; dysentery, 6; ophthalmia neonatorum, 88. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Jan. 7th–8th was as follows:—Small-pox, 437 under treatment, 27 under observation (last week 415 and 13 respectively); scarlet fever, 2633; diphtheria, 2701; enteric fever, 28; measles, 824; whooping-cough, 126; puerperal fever, 27 (plus 15 babies); encephalitis lethargica, 121; poliomyelitis, 2; "other diseases," 18. At St. Margaret's Hospital there were 14 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 4 (1) from enteric fever, 47 (22) from measles, 10 (1) from scarlet fever, 21 (5) from whooping-cough, 63 (18) from diphtheria, 62 (20) from diarrhœa and enteritis under two years, and 64 (11) from influenza. The figures in parentheses are those for London itself.

The 3 deaths from enteric fever outside London all occurred at Newcastle-on-Tyne. Stoke-on-Trent and Wigan each reported 4 deaths from measles, West Ham and Manchester each 3. Cardiff reported 3 deaths from whooping-cough. Diphtheria claimed 4 victims each in Birmingham and Merthyr Tydfil. Of the deaths attributed to influenza 6 were reported from Birmingham, 5 from Bradford.

The number of stillbirths notified during the week was 262 (corresponding to a rate of 37 per thousand births), including 50 in London.

Special Articles.

DENTAL TREATMENT AND NATIONAL HEALTH.

REPORT BY THE NATIONAL DENTAL SERVICE COMMITTEE.

A REPORT issued by the British Dental Association, 23, Russell-square, London, W.C.1, is based on certain unfulfilled recommendations of the Departmental Committee on the Dentists Act (Cmd. 33, 1919), and deals with the dental services which are necessary to the national health under the following heads:—

1. Dental treatment of expectant and nursing mothers and for children up to 5 years of age.
2. Dental inspection and treatment of all children of school age.
3. Dental treatment of adolescents.
4. Dental treatment for all persons insured under the National Health Insurance Act, and for all other adults who are unable to afford dental treatment by private dental practitioners.
5. Dental treatment as an essential element in cases of tuberculosis and of venereal disease.
6. The institution of a coördinated scheme for education in oral hygiene, which would be simple in its application and general in its incidence, but with particular attention to the young, with the object of preventing dental disease.

The suggestions made are in general agreement with the scheme outlined in the Interim Report of the Ministry of Health Consultative Council on Medical and Allied Services (Cmd. 693, 1920). Means are also suggested for the organisation of such dental services, and for the supply of the necessary personnel.

Recommendations.

In brief the recommendations of the Service Committee are these:—

1. That dental treatment be organised at every maternity and child welfare centre.
2. That in the first place the efforts of the profession should be concentrated on obtaining a complete school dental service.
3. That by a suitable scheme of dental treatment for adolescents the complete school dental service be linked up with statutory dental benefit under an amended National Health Insurance Act.
4. That effective supervision and inspection of all public dental services should be carried out by dental practitioners responsible to the controlling authority.

Finally, stress is laid on the importance of education in dental hygiene being consistently emphasised.

KING EDWARD'S FUND.—During the absence of the Prince of Wales in Africa his power as President of the Fund have been confided to a commission consisting of the Lord Chancellor, the Speaker of the House of Commons, and the Governor of the Bank of England.

MEDICAL REFEREES ON INDUSTRIAL DISEASES.

(FROM A SCOTTISH CORRESPONDENT.)

IT is notable what a large proportion of experience in all matters relating to the compensation code for workmen occurs in Scotland. Recently this has been specially observable in the case of miner's nystagmus. The case of Lowe *v.* Wilsons and Clyde Coal Co., decided in the Scottish Court of Appeal and reported in 1930 *Scots Law Times*, 28, makes important reading, for the main point in it applies to the functions of medical referees in all compensation cases based on disablement following on an industrial disease.

The medical referee in that case stated that miner's nystagmus does not necessarily prevent the workman from working underground and drawing full wages; implying a distinction between the date of the commencement of the disease and the date of disablement to earn full wages. It was the failure to make this distinction which tended to create a tangle in the Lowe case. Before the days of compensation in industrial disease cases many nystagmic miners kept on at their work underground, driven by necessity to do so in order to support themselves, their wives, and families. This is still done by determined men, because full wages are more than the compensation allowance.

In these compensation cases based on disablement to earn full wages owing to an industrial disease there is a special sub-code. The workman applies to the certifying surgeon for a certificate that he is suffering from an industrial disease and is thereby disabled from earning full wages. If the certificate is granted the surgeon is to state the date of commencement of disablement if he can; if not, the date of the certificate is taken. Of course, the surgeon may refuse to give a certificate, and then he is not concerned with any date. In either case there may be an appeal to a medical referee. The Act says that, if the referee grants a certificate where the surgeon had refused it, the referee shall fix the date of commencement of disablement. It does not say that, if the referee agrees with the surgeon that the workman is entitled to a certificate, the referee may alter the date which has been fixed by the surgeon. Power "to alter or not to alter," that is the question. There is no judicial decision upon it. It has never even been argued, except in this latest case in Scotland. There have been judicial opinions expressed in England and in Scotland in favour of the medical referee possessing this power, but they are merely obiter dicta, and so is the very definite reasoned opinion to the contrary pronounced by one of the judges of the Scottish Court of Appeal in the recent case. It is worth while to draw attention to the doubt surrounding this question and this latest judicial opinion on it.

The case also has a bearing on the proper way for medical referees to draw up their reports in such cases. They went considerably astray in this respect. The report had to be sent back to the referee to state plainly whether he sustained or refused the appeal from the certifying surgeon, who had found the workman entitled to a certificate. Then the referee added "I therefore sustain this appeal." Even after that, parties were at sixes and sevens as to what the report meant. Probably that was due to the word "therefore," which gave a connexion with preceding matters, some of which was irrelevant and may have been ultra vires. It has to be kept in view that medical men in these cases are not entitled to legal advice, and it is said that the forms supplied to them are the reverse of helpful. Clearly the ordinary professional curriculum should include some degree of instruction in such matters. But the doctor must read the Acts and other documents; he must attend to the specific questions put to him; these he must exhaust; at that point he must draw the line and refuse to step beyond into matters with which he has nothing to do, and which he may not be qualified to deal with. Reasons and reasonings, comments and explanations, including the process by which he has arrived at his decision, will usually be unnecessary and may be damaging.

Neglect of these rather obvious guides may lead to a report being sent back to its author to explain, not a mere detail, but the cardinal point whether the report is "Yes" or "No." That ought to have been found in a few unqualified and unambiguous words in the first line of the report. The history of this case shows that it must be clearly understood what is the question to which an affirmative or negative answer is being given. The reporter appears to have been misled into importing into his functions a question as to the commencement, not of the disablement, but of the disease. Not only so, but there were also in the report words which appeared to express or suggest that the doctor was applying his mind to the legal question whether a previous cash settlement with the workman amounted to compensation in respect of the disablement for which he was now claiming. It is all in the medical man's own interest that his sphere of function in such matters should be as circumscribed as possible. It may well be that he could add much accurate and valuable information and advice, but he is not instructed to do so nor safe in doing so.

MEDICINE AND THE LAW.

Alleged Negligence: Diphtheria Infection.

As a legal correspondent points out on another page, the recent Scottish case of Carmichael *v.* Miller is of considerable interest. Indeed, the issues of fact in the case, in which a series of allegations of negligence against the late Dr. Miller was dismissed by Lord Fleming at the close of last year, are almost as well worth notice as the issues of law.

Duncan Carmichael, a dairyman near Fort William, had a son Duncan, 2½ years old, who on Dec. 31st, 1925, was admitted to the local hospital suffering from scarlet fever. The disease took a normal course till 26 days later, when what appeared to be a secondary attack supervened with sore-throat, pyrexia, and copious rash, desquamation meanwhile continuing. Dr. Miller, medical officer of health for the burgh and medical superintendent of the hospital, and his assistant, Dr. Mackintosh, diagnosed this as a secondary attack of scarlet fever. Another doctor, and also the fever nurse and matron, agreed. The rash was typical scarlet fever rash and none of the clinical appearances of diphtheria was observed. There was otorrhœa, but this was slight and intermittent, and on March 1st, 1926, the child was sent home. Six days later a sister, aged 8, and a brother, aged 7, were notified as suffering from diphtheria and were admitted to the diphtheria ward of the hospital. The girl died; the boy recovered. Another brother was admitted on April 24th suffering from virulent diphtheria; he eventually recovered. The original patient, Duncan, was readmitted on April 24th suffering from a recurrence of otorrhœa, a brushing of which had shown bacilli resembling those of diphtheria. He was kept in hospital till August 3rd, then discharged as cured (the otorrhœa having ceased), readmitted on August 16th on a recurrence of the discharge, removed to Glasgow in November for enucleation of tonsils and adenoids, readmitted at the end of 1926 on a further recurrence of the discharge, and at length finally released from hospital in June, 1927. This long series of illnesses might well have led his father to suppose that the treatment was in some way at fault: he brought his action against Dr. Miller, alleging negligence in various ways. First, it was suggested, the child, when originally discharged from hospital, showed typical post-diphtheritic symptoms, a squint, nasal speech, and unsteady gait. The evidence of these symptoms was vigorously disputed, and the judge held there was no proof of the presence of diphtheria at the date of original discharge from hospital. Lord Fleming therefore decided that there was no negligence on Dr. Miller's part in failing to diagnose diphtheria if the child really suffered from it. The next allegation was that it was negligent to release the patient from hospital while the ear was still discharging. It was proved in evidence that otorrhœa after scarlet fever may continue for years. Lord Fleming said the evidence failed to establish that it was in contravention of the usual or reasonable medical practice to discharge patients suffering from intermittent scarlet fever otorrhœa. He refused to say that Dr. Miller had fallen short of the ordinary standard of professional care and skill in sending the child home before the otorrhœa ceased; thus the second allegation was disposed of. It was, however, argued alternately against Dr. Miller at this point that he ought to have had a bacteriological examination of swabs from the ear. But there was no proof of any practice at hospitals to take this precaution in the absence of complications. The judge held that there was at this stage nothing to cause Dr. Miller to suspect a diphtheria complication, nor did he so suspect; if, therefore, the child was discharged in an infectious condition, Dr. Miller was not to blame or legally responsible. In view of this finding, Lord Fleming held it to be unnecessary to consider whether the brother and sister became infected with diphtheria owing to contact with the original patient; as, however, the point was pressed in argument, the judge dealt with it. The subsequent bacteriological examinations of swabs from the child's ear were apparently positive in seven cases and negative in five as regards diphtheria. This indicated to the judge that the evidence was far from strong; there was, he said, no clinical history to show conclusively that the child ever suffered from diphtheria; it was not proved that the diphtheria bacilli present in the child's system were of the virulent type. "If I had to decide this question," said Lord Fleming, "I think I should be bound to hold that the pursuer had failed to prove that the diphtheria of which the sister died had been contracted by infection from Duncan." Finally he observed that not only was Dr. Miller not guilty of any negligence, but that the children had received every proper care and attention while in his hands. He added a sympathetic reference to the unhappy misfortunes of the family. Without failing in sympathy to the father of these unfortunate children, the medical profession will have some sympathy, too, for the doctor whose professional reputation was attacked. The proceedings are estimated to have cost Dr. Miller's representatives not less than £1000. As it is understood that there is scant chance of recovering this sum from the unsuccessful claimant, the case (in which the Medical and Dental Defence Union of Scotland undertook responsibility) is another instance of the importance to the medical practitioner of being adequately covered against such losses.

The Question of Law.

With regard to the broader question of law which the legal correspondent has raised, the nature of the claim is similar to that in the action of Evans against the Liverpool Corporation, tried by Mr. Justice Walton in 1906. On that occasion the alleged facts were that a boy, 6 years old, had a mild and ordinary attack of scarlet fever, that he was removed to the corporation's fever hospital for acute cases, and was passed out to the corporation's convalescent home a month later; a few days afterwards one brother, and subsequently two other brothers, developed the disease. The plaintiff said the visiting physician of the convalescent home was negligent in allowing the boy to leave while still infectious; also that the matron and nurses were negligent in examining the boy and reporting his condition. The jury found the physician was negligent, and that the damage complained of was suffered in consequence; the matron and nurses were not held negligent. The case became a leading authority on the legal responsibility of a public authority like the Corporation of Liverpool for the actions of the medical staff of its hospitals. There was also this further point. The plaintiff contended that the doctor was negligent and that the corporation was responsible for their employee's negligence. But, quite apart from any question of the relationship of master and servant, the plaintiff's counsel argued that the corporation was liable because it had a duty not to discharge a patient likely to communicate infection. There is a well-known principle of English law laid down in the text-book case of Fletcher *v.* Rylands where one landowner constructed on his property a reservoir which afterwards overflowed and damaged the property of a neighbour. The broad principle in Fletcher *v.* Rylands is that a man who keeps a dangerous thing on his property is liable if that thing escapes and causes damage elsewhere. So, in Evans *v.* the Liverpool Corporation, it was argued that the corporation had brought upon their premises a person dangerous to others and were liable if they allowed him to go outside while in a dangerous (i.e., an infectious) condition. Walton, J., came to the conclusion that there was no sufficient ground for holding that any such duty or obligation existed on that occasion.

A patient who sues a doctor for alleged negligence does not necessarily rely upon the existence of an implied contract to use adequate care and skill. Anyone who suffers from medical malpraxis is not obliged to establish privity of contract in order to recover damages. The claim can be put forward as a breach of duty as well as a breach of contract. The doctor who undertakes to treat any patient represents himself as possessing ordinary professional capacity. In the old legal phrase, *spondet peritiam*, he pledges his skill and becomes bound for the exercise of adequate professional care. If by his lack of capacity or care the patient is injured, the patient has an action against the doctor for the breach of the duty owed in this respect. The recent Scottish action, set out at length above, establishes no new principle because, fortunately, the plaintiff failed all along the line. The only point on which Dr. Miller's representatives did not succeed was an initial attempt to invoke the shelter of the Public Authorities Protection Act. That enactment, like the protecting words in Section 330 of the Lunacy Act, has scarcely been as useful to the medical profession as Parliament may be supposed to have intended.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

The Sale of Wine Tonics.

THE free sale in drug stores of tonics containing and largely consisting of wine has been a large source of leakage of potable alcohol through the legal sieve of prohibition. Apparently some attempt is to be made to dry up this source and apparently the medical profession will not lend much support to the attempt. The indications are found in a letter to *California and Western Medicine* (December, 1929, xxxi., 445) and in editorial comment thereon. The correspondent encloses a copy of an ordinance recently passed by the city council of Los Angeles prohibiting the sale of wine tonics, defined as "any tonic or any medicinal preparation containing one-half of 1 per cent. or more of alcohol by volume, which is capable of being used as a beverage." The penalty prescribed is $500 for each sale or six months' imprisonment or both. No exemption is made for prescriptions of any kind. The ordinance was passed over protests from the pharmaceutical and medical professions. The mayor signed it after it had been pointed out to him that the definition of wine tonic was such as to include a number of common prescriptions. Several other cities in the State of California are said to be preparing ordinances modelled on that of Los Angeles. Says the editorial writer: "It must be self-evident to any person of reasonable knowledge of the world that an ordinance such as this . . . will not be literally and impartially enforced. This is the kind of law-making which does much to lower the respect of many citizens for all law." It is possible that a referendum will be demanded in which case the ordinance will lie over until election time in the autumn of 1930.

Enforcement of Prohibition.

The report of the prohibition commissioner for the last fiscal year records 66,878 arrests and 55,546 convictions, including 19,074 jail sentences. The aggregate of these sentences amounts to 7443 years' imprisonment. Fines totalling more than $7,000,000 were imposed by the courts. More than 7000 automobiles valued at nearly $3,000,000 were confiscated. Senator Borah has recently attacked the administration on the ineffectiveness of prohibition enforcement. After his speech in the Senate he visited President Hoover, who is said to be contemplating measures for increasing the severity of enforcement.

Infectious Disease.

The report of the Public Health Service now published covers the calendar year 1928. The high incidence of small-pox is maintained. Deaths from pellagra are increasing despite our new knowledge of the ætiology of this disease. The deaths from this cause in 1928 were 6652 as compared with 4794 in 1926. Reported cases of tularæmia were 480 with eight deaths; but that many cases must have gone unreported. The tuberculosis death-rate of 77·5 per 100,000 is the lowest on record in this country. Low records were also made for typhoid fever and for diphtheria. Brill's disease was prevalent especially in the South-Eastern States; 143 cases were reported and 12 deaths. The Department of Commerce reports a general death-rate of 12 per 1000 as compared with a rate of 11·4 in 1927. The greatest increase was shown in deaths from heart disease. Controlled statistics on the efficacy of toxin-antitoxin administration are available in the report of the Detroit Department of Health. There are in the city 153,000 children under 11 years of age who have been immunised, and 142,800 who are still unprotected. There have been no cases of diphtheria among the former group but 1805 cases with 222 deaths among the latter. The city health department has a list of over 800 physicians who will give toxin-antitoxin at stated hours, charging $1.50 per injection to those who can pay and nothing to those who cannot.

Health and Scholarship.

The relationship between health and scholastic attainment has been investigated at the University of Minnesota. Records were made of physical defects, habits of living, and social and economic status of 141 university students who were on probation because of poor scholarship. Corresponding observations were made on 496 students who were doing satisfactory work and who came voluntarily for health examination. The same physicians made both sets of observations and the statistical results were then analysed, the chi square test of independence being used to compute the possibility of a chance difference equal to or greater than the observed difference between the two groups. The probation group showed an excess of some physical defects that was almost certainly significant. There were: defective hearing of extreme grade, overweight, flabby musculature, and anæmia. Other factors associated with poor scholarship were found to be: student completely self-supporting; employment at physical or clerical work during the summer vacation; student considers himself particularly self-conscious; student gives four or more affirmative replies relative to the emotional make-up of the individual.

An Ape Farm in Florida.

A gift from the Rockefeller Foundation has made possible the acquisition by Yale University of an ape farm in Florida. The farm will include a special laboratory for psychobiological research and will at the same time be a source of supply of anthropoid apes for the laboratory in New Haven. It will be under the general direction of Prof. Robert M. Yerkes, who began the work on comparative psychobiology at Yale five years ago. The headquarters of research will remain at Yale and will be associated with the new Institute of Human Relations, but senior members of the staff will make frequent visits of some months' duration to the station in Florida. Observational field camps are also to be established in Africa and Malaya where the anthropoids and other primates will be studied in their natural environment.

Professional Advertisement.

Some interest has been aroused by the recent suggestion of the editor of the *Bulletin of the Chicago Medical Society* that the medical profession should use the advertisement columns of the daily papers for making known the economic and scientific problems with which they are faced. This is hailed in some quarters as a withdrawal from their traditional position. As a matter of fact, it is not at all a novel suggestion in this country. Advertising by medical societies in the lay press has already been practised in many parts of the country. It may serve not only to put the views of the local medical group in regard to social medicine but also, and perhaps better, to educate the public in regard to the possibilities of preventive medicine. Many medical men feel a quite natural reluctance to urge upon their patients such measures as the periodic health examination or the use of toxin-antitoxin knowing that they must charge a fee for such services if they are accepted. At the same time the satisfaction of doing preventive work and the consciousness of its importance make it hard to keep entirely silent and to wait for all initiative from the public. Group advertising provides the remedy.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

The Edinburgh Royal Infirmary Appeal.

AT the annual meeting Lord Provost Whitson intimated that the appeal will be launched this summer. The Royal Infirmary, which boasts of never having refused an emergency case, completed its 200 years of service last year. The initiative in founding the infirmary was taken by the Royal College of Physicians, and it has developed into a splendid centre in which the Royal Colleges play a greater part than ever. Its growth is one of the romances of medicine. Last year there was a slight falling off in the ordinary income, but there was a considerable increase in the extraordinary income. While the ordinary annual income is in the region of £115,000, extraordinary income totalled nearly £140,000 last year, and there need be little fear for an institution so deeply rooted in the community. No doubt the waiting-list is still considerable, but the efforts to meet it are commensurate. The Regional Hospital Committee for the South-East of Scotland including Fife is considering the developments of the immediate future. The Edinburgh Town Council and other local authorities in the area must submit their schemes to the Department of Health before the end of March. When all these are collated and analysed we shall have the beginning of a regional hospital organisation. Misgivings in the minds of those in charge of the smaller hospitals arise mainly from the novelty of the programme; as the facts are more closely scrutinised the difficulties of adjustment will disappear. Meanwhile the infirmary is contemplating an appeal to the general public in order that the extensions over the Watson School site may proceed. It is understood that these extensions will include obstetrical and gynæcological wards, but the pressure from the public demand, both urban and rural, continues high, and it is possible that these extensions may not be adequate. There can, however, be no doubt that the South of Scotland will make the same handsome response as the North-East has done in the last three or four years to the Aberdeen appeal.

Delay in Rendering Accounts.

A claim of over £200 by a medical practitioner for professional fees has lately been dismissed in the Scottish courts. The patient died two years ago at the age of 78, and the claim covered services rendered over a period of 16 years. His executors contended that he was throughout this period a panel patient. At first, they said, the doctor treated him along with the rest of his fellow-workmen under an arrangement by which the employers accepted responsibility for the cost of treatment. Later he was an ordinary panel patient, and for the final eight years (after reaching the age of 70) he remained entitled to medical benefit without further contribution. These contentions being issues of fact accepted as established before the court of first instance, there is no more to say of them unless in the event of an appeal. No doubt there were special reasons for the delay in pressing the claim; there is no need to emphasise the disadvantage of allowing an account to run too long. A judge instinctively dislikes stale claims; the law itself has no tenderness for them. In England the Statute of Limitations peremptorily draws the line at six years unless the debtor has kept his liability alive by some form of acknowledgment or part payment. Patients themselves would be more than human if gratitude for professional services did not diminish as the past recedes in the memory. The medical profession has perhaps a special duty to be businesslike in the rendering of accounts, for by custom the patient leaves to the doctor the task of deciding what fee is reasonable and of keeping a record of visits and details of treatment. Indeed on the rare occasions when the items of the doctor's bill are challenged as excessive, it is usually because the account has been allowed to run so long that the final total surprises by its magnitude.

Greenock Auxiliary Hospital.

Greenock, a town of over 80,000 inhabitants, has added to its resources by opening at Larkfield an auxiliary hospital which cost £60,000 to build. The hospital has two wards of ten beds each for convalescent patients from Greenock Royal Infirmary. It has also —and Sir Donald McAlister commented on the importance of this—a wing of rooms with accommodation for 20 paying patients. The new hospital is situated on the north slope of the Inverkip valley in a very picturesque situation. Mr. Matthew Rankin and his sister had offered £20,000 on condition that the work was commenced within a year. Greenock is an extremely busy ship-building and shipping centre, as well as the examining station for the Clyde Port Sanitary Authority

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BETHNAL GREEN POOR-LAW HOSPITAL.—Lord Monk Bretton, Chairman of the London County Council, last week opened a new operating theatre suite which has been provided at this hospital by the guardians at a cost of £7000. The theatre contains a gallery from which probationer nurses can watch the operations through a glass screen; a shower-bath has been provided for the surgeons. The old theatre had become unsuitable for the performance of nearly 1000 operations a year.

NEW DELHI HOSPITAL.—On Friday last the Viceroy of India, Lord Irwin, laid the foundation-stone of the new general hospital for New and Old Delhi. When completed the institution, which is to cost £562,000, will contain 364 beds; the first portion, to be ready in two years, will provide 254 beds. In his speech the Viceroy said that the hospital appeared to be condemned—by reason of the reluctance of Indian women to become nurses—to open with an insufficient nursing staff, and he appealed to them to contribute more of their number to the nursing profession.

Correspondence.

"Audi alteram partem."

COMPULSORY TREATMENT OF VENEREAL DISEASE: A PROTEST.

To the Editor of THE LANCET.

SIR,—The question of the compulsory treatment of venereal disease is again being raised. A conference of representatives of local authorities, held under the auspices of the British Social Hygiene Council in Glasgow on Oct. 18th, 1929, passed a unanimous resolution urging the Corporations of Edinburgh and Glasgow to continue their efforts to obtain from Parliament additional powers for the control and treatment of persons suffering from venereal disease. In the late Parliament Bills in favour of compulsory treatment were thrown out, and the reports of the principal officer show that the Ministry of Health may again oppose such legislation. It seems incredible that the advisers of the Scottish corporations should have kept them in ignorance of the important facts which have recently been added to our knowledge and which show that Parliament took the right line.

It is obvious that the V.D. campaign is not the success which was anticipated, although more people present themselves for diagnosis, no less than 34 per cent. being found on examination *not* to be suffering from venereal disease. There has been a decline in the number of patients suffering from syphilis since 1920, the peak year, but a careful examination of records from clinics in different countries shows that the curve of fall, 1920–1926, is suspiciously like the decline curve of many kinds of epidemic, and may, therefore, have no relation to treatment. Moreover, it is reported from many quarters that there has been a slight increase since 1926, although there has been no abatement, but rather an increase in the amount of treatment.

Even in 1913, the year of the International Congress in London, which might be called the apotheosis of salvarsan, the idea of a *therapia magna sterilisans* was already shaken, for combined arsenic and mercury treatment was advocated. It soon became evident that the intravenous injections were of greater immediate danger to the patient than syphilis itself, and those who had experience of mass salvarsan therapy during the war will remember that many lives were lost thereby. To avoid the grave nervous complications, and the damage to the liver and skin, it became necessary to weaken the drug and to give smaller and smaller doses. Standard courses such as are described in the recent report published by the Medical Research Council[3] consist of at least 20 doses of "914" (with either bismuth or mercury) for a sero-negative primary case, and 30 or more in a sero-positive primary, and so on, in rapidly increasing ratio.

Now, Klauder[1] has shown that repeated small doses of arsenical compounds may produce in animals arsenic-resistant spironemes, and there is good reason to believe that this obtains in man. A leading London syphilologist writing to me recently stated that he was certain that the cases of syphilis seen to-day were more refractory to treatment than those seen ten years ago. Long ago Finger pointed out the risk of converting a disease which was mainly an affection of the skin and mucous membranes into one in which the heart and great vessels and central nervous system were involved. Prof. Sarbó,[2] of Budapest, has observed that the incubation period of general paralysis has been shortened and suggests that under the influence of treatment the life-history of the spironeme is changed, and that the organisms hide up in the adventitia of the vessels and in the organs, and there multiply when the resistance of the host weakens. Even Colonel Harrison,[3] so long an advocate of repeated injections, now says: "It may be that in giving a long series of injections we may be damaging a very necessary ally in the shape of the tissues." In fact, he has now reverted to larger spaced doses, on a principle followed by Drake and Thompson[4] at King's College Hospital for many years.

The most disquieting evidence yet produced is that of Prof. A. Warthin,[5] who, at Manchester, gave the results of a large number of post-mortems on syphilitics, who had had prolonged arsenobenzol treatment, and stated that he had seen *no single case of cured* syphilis. Most of the organs and the great vessels and heart showed active disease. Langer[6] reports an enormous increase in aortic disease from 33 per cent. in 1907 (before salvarsan) to 63 per cent. in 1915, and 83 per cent. in 1925. These observations are confirmed by Bergel and Rosenthal's[7] statistics from 70,000 autopsies. There is also evidence of uneasiness in the minds of neurologists as to the increase of general paralysis and tabes.[8] [9]

On the other hand, the remarkable papers of Bruusgaard[10] and his Norwegian colleagues demand our earnest study. Here we have a careful follow-up, over many years, of a large number of patients who had been under the care of the great Cesar Boeck. Boeck held that syphilis produced its own immunity, and that the so-called specific remedies merely removed symptoms. His patients were, therefore, practically untreated. Yet the incidence of G.P.I. in Bruusgaard's long series was only 0·6 per cent. The full significance of these observations, both on the nervous system and the great vessels, must be studied in the original. In this connexion it is worthy of notice that African races, suffering from widespread syphilis, rarely show either G.P.I. or tabes, and they are almost untreated. It cannot be a different strain of spironeme for grave nervous symptoms are seen in Europeans who contract the disease from the native. Fierlinger,[11] in the League of Nations Report, doubts whether there is a real decrease in the incidence of syphilis, and whether the treatment has the value claimed for it, and states that inquiries on a large scale are being made, and hopes to have an analysis of 50,000 cases by the end of the year.

It is to be hoped that somebody will make an inquiry on Bruusgaard's lines, and it would appear to be a form of research worthy of the attention of the Medical Research Council. The investigators must obviously be independent of the clinics, and there must be an authoritative statistician. The recent report of the M.R.C. is on quite different lines and valueless for the proposed inquiry.

Lastly, I recall that just as Boeck believed in the self-cure of syphilis, my old teacher, Sir Jonathan Hutchinson, taught forty years ago that "time as well as mercury cured syphilis." Leading homœopaths have told me the same; and now, I note, that Dr. Osmond of St. Thomas's has made the same discovery, for he says "to establish a cure, time is just as important as a negative Wassermann."

I trust, therefore, that the advisers of the Scottish Corporations will restrain the worthy baillies from pressing for penal legislation, for a very good case could be made for "conscientious objection" to prolonged treatment on present lines.

I apologise for this long intrusion on your space, and hope that some competent authority may take up the question of gonorrhœa.

I am, Sir, yours faithfully,

JAMES H. SEQUEIRA, M.D., F.R.C.P. Lond.,
F.R.C.S. Eng.,

Consulting Physician to Skin Dept., London Hospital; late a Member of Lord Trevethin's Committee, and Chairman, Society for Prevention of Venereal Diseases.

Kenya Colony, B.E.A.

References.

1. Klauder, J. V.: Archiv. Derm. and Syph., 1923, vii., 730.
2. Sarbó A.: See THE LANCET Report, 1929, i., 411.
3. Harrison, L.: Special Report Series, Med. Research Council, No. 132, p. 14.
4. Private letter from Dr. J. A. Drake.
5. Warthin, A. S.: Brit. Med. Jour., 1929, ii., 236.
6. Langer: Münch. Med. Wochenschr., 1926 (quoted by Bruusgaard).

(*Continued at foot of next page.*)

INFECTIVE TONSILS AND RHEUMATISM.

To the Editor of THE LANCET.

SIR,—In their very interesting study of rheumatic disease in children, published in THE LANCET of Jan. 11th, Dr. Campbell and Dr. Warner have scarcely justified their conclusion that "complete enucleation of the tonsils is without effect in preventing the onset of rheumatism." In their Table XV. they show that the incidence of rheumatism, subsequent to tonsillectomy, in completely tonsillectomised children is the same as in non-tonsillectomised children, and that in incompletely tonsillectomised children the subsequent incidence of rheumatism is double that in either of the other two classes. Now it may be presumed that tonsillectomy, whether complete or incomplete, is performed because the tonsils are diseased, and therefore that all the children who had a tonsillar operation had diseased tonsils. Incomplete removal of diseased tonsils is tantamount to doing nothing, for the focus of infection still remains. On the showing of the authors, in their series of children with diseased tonsils, the incidence of rheumatism following incomplete tonsillectomy was double that following complete tonsillectomy. It is difficult to escape the conclusion that, in the series of cases quoted, complete tonsillectomy did reduce the incidence of rheumatism.

I am, Sir, yours faithfully,
WILLIAM W. KAY.

Medical School, The University, Manchester, Jan. 11th, 1930.

GASTRIC DEFECT IN PERNICIOUS ANÆMIA.

To the Editor of THE LANCET.

SIR,—In an interesting annotation last week (p. 92) on the Effect of Liver on Nervous Lesions of Pernicious Anæmia, you say

> "there can be no doubt of the persistence of achylia gastrica under liver treatment, and it certainly seems as though liver therapy was largely symptomatic and not directed towards the actual cause in this disease. . . . Truly radical therapy is likely to take the form of eradication of some provocative toxin . . . rather than the removal of symptoms by the use of liver."

The fact that achlorhydria persists while the patient under liver treatment maintains excellent health appears to me to point in a very different direction—namely, that achlorhydria plays no important part in the pathogenesis of pernicious anæmia and subacute combined degeneration. The discovery of achlorhydria in these two conditions was an enormous diagnostic advance, but it advanced treatment not at all. The administration of hydrochloric acid to these patients in the last ten years has produced no demonstrable result.

I was surprised that in this article no reference was made to the interesting and relevant experiments of Castle and Townsend which were fully reviewed in a leading article in your columns three months ago. (1929, ii., 829.) These experiments went to prove that the cause of pernicious anæmia was a gastric defect which resulted in the absence of a "principle" (formed by an enzyme action of the normal gastric juice on protein) necessary for the prevention of pernicious anæmia; this principle being elaborated in every normal stomach, and even, presumably, in those many stomachs which have achlorhydria, and whose possessors do not develop pernicious anæmia. These experiments suggest to me (though not apparently to the authors) that while the gastric defect and the absence of enzymes are all-important the achlorhydria itself may play no part in the development of the disease; in which case the achlorhydria is but a side issue—a natural consequence of the gastric defect.

This uncertainty as to the influence of achlorhydria on the pathogenesis of pernicious anæmia is an excellent illustration of the problems which the biochemist is setting (or the pits he is digging) for the clinician by the multiplication of chemico-physical analyses of body fluids. *An alteration in blood-calcium, blood-cholesterol, blood-sugar, blood-urea,* hydrogen-ion concentration, sedimentation velocities and (save the mark) the hydration of protein particles, all propound the same question. Is it a link in the causative chain of a disease or a by-product of the morbid process? This is a problem that may occupy the physician and the biochemist for a century.

Your annotator appears to agree with D. McAlpine[1] that the evidence is against the improvement or retardation of subacute combined degeneration under liver treatment. If this is so, and the theory of Castle and Townsend is accepted, it is certain that the cause of the gastric defect in pernicious anæmia and the toxin which poisons the nerve parenchyma are identical—that is to say, the alteration in gastric secretion has no part in the development of the nervous lesions. In this case it seems to me illogical for McAlpine to insist as strongly as he does on the necessity for the administration of hydrochloric acid to these patients with subacute combined degeneration. Your annotator appears to speak somewhat disparagingly of the "removal of symptoms by the use of liver," but I regard it as *first-rate substitution-therapy* strictly comparable to use of insulin in diabetes. It is likely to be a long time before we are able to prevent the poisoning of the enzyme-secreting cells in the stomach or the exhaustion of the beta-cells in the islands of Langerhans. Until that day of "truly radical therapy" dawns we shall have to be content with symptomatic treatment such as liver and insulin.—I am, Sir, yours faithfully,

Derby, Jan. 12th, 1930. DOUGLAS HUBBLE.

Dr. SEQUEIRA: *References.*

(Continued from previous page.)

7. Bergel, S., and Rosenthal. O: Med. Klin., 1929, xxv., 6; Review, THE LANCET, 1929, ii., 672.
8. Reid, W. J. S.: Brit. Med. Jour., 1929, ii., 916.
9. Alluralde and Seppich (Buenos Aires): Bulletin Internat. d'Hyg. Path., 1928, p. 195.
10. Bruusgaard, E.: Archiv. Derm. u. Syph., Band 157, Heft 2, pp. 309–332.
11. Fierlinger: Reported Brit. Med. Jour., 1929, ii., 626.
12. Osmond, T. E.: THE LANCET, 1929, ii., 677.

EMPHYSEMA TREATED BY MECHANO-THERAPY.

To the Editor of THE LANCET.

SIR,—I confess that I am amazed at Dr. Kellgren-Cyriax's contention that the barrel-shaped emphysematous chest can be made permanently smaller—and to a substantial degree—by mechanical means, and that such reduction in size is capable of benefiting the patient. Further, I cannot but think that the doctor is carried away by her enthusiasm (a useful asset in its way, though sometimes dangerously misleading), in claiming to be able to restore, "in greater or less degree," the loss of pulmonary elasticity characteristic of hypertrophous emphysema, and that she is as little likely to achieve success in this as in an attempt to restore the unwelcome tell-tale loss of cutaneous elasticity (with its accompanying wrinkles) which so obstinately progresses with the flight of time.

I would remind Dr. Kellgren-Cyriax that I did not in my letter suggest that any harm would result from properly devised expiratory exercises in hypertrophous emphysema, nor that fatal asphyxia would result from them: my point was that the enlarged thorax of emphysema is compensatory, and that if the thorax of a patient, suffering from advanced hypertrophous emphysema, were reduced to the dimensions normal to that person in early adult life, he would effectually be asphyxiated.

Seeing that Dr. Kellgren-Cyriax has the opportunity of treating many cases of advanced hypertrophous emphysema, may I suggest a line of valuable clinical investigation? Let careful measurements and circumferential tracings of the chest be made before and after treatment of ten successive cases of the barrel-shaped emphysematous chest, these measurements and tracings to be taken by an independent, skilled observer, who shall not know whether the patients have undergone special treatment. In order to ensure accuracy, the weight of the patient should be taken before and after treatment, and a note of the amount of adipose tissue enveloping the bony thorax. I am, Sir, yours faithfully,

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[1] THE LANCET, 1929, ii., 643.

Harley-street, W., Jan 12th, 1930. HARRY CAMPBELL.

MEDICAL FOUNDATIONS:

A RENEWED PLEA TO TESTATORS.

To the Editor of THE LANCET.

SIR,—About a year ago you allowed me to publish in your columns a plea that those members of the profession who are without dependents, or have more than sufficient to provide for their dependents, should be urged when disposing of their property by will to consider the claims of the two great professional charities, the Royal Medical Foundation of Epsom College and the Royal Medical Benevolent Fund.

From certain private correspondence which ensued I have reason to believe that this plea may in time bear some fruit; but it has by no means gained sufficient acceptance, to my mind, and I ask your permission to reiterate it. Only last week the press contained particulars of the will of a Doctor of Medicine who left over £100,000 for distribution between ten charities; had he added the two I have mentioned to the list, he would have solved many difficulties for their councils, which are seriously hampered for lack of funds. Another member of our profession left £10,000 last year to charity: half to a hospital, and half to the Lifeboat Institution, if I remember rightly. Yet another left a large sum, about £50,000 I believe, to an educative foundation in the North.

There are few of us who can ever hope to distribute money to charity on this scale. But those few can do so much for their professional colleagues, through the two great medical charities, that they may surely be urged to recognise a duty in this matter superior to other claims, even when the latter include such excellent institutions as hospitals, universities, and lifeboats. I am, Sir, yours faithfully,

HENRY ROBINSON.

16, Bramham-gardens, S.W., Jan. 12th, 1930.

TREATMENT OF THE TYPHOID FEVERS.

To the Editor of THE LANCET.

SIR,—I would venture to comment on certain statements in Dr. A. E. Gow's very instructive articles in your issues of Jan. 4th and 11th. My experience of typhoid dates from the Boer War, when for a year I had charge of 90 enteric beds which were always full, convalescents being transferred at an early stage to other lines. My mortality of 30 compared favourably with that of others and to that extent supports the principles of treatment which I adopted. Dr. Gow recommends three pints of milk with additions; I consider the typical enteric stool to be the product of three pints of milk imperfectly digested. I gave a maximum of one pint of milk, supplemented by raw meat juice and white of egg with lemon juice. The chief danger of enteric is from distension and its complications; imperfect digestion is therefore very dangerous. I question whether enteric patients should not, like babies, be fed three-hourly instead of two-hourly.

I should like to see all enemas given by means of a douche can with a No. 12 catheter on its nozzle, and I have never found soap-and-water enemas with an ounce of turpentine do any harm. Talking of drug treatment, my 90 beds being arranged in rows of 30, I tried various things and found a quarter of a grain of calomel six-hourly useful in disinfecting the intestinal contents and keeping the actions regular, and I soon adopted it for all my patients. I avoided carbolic derivatives as likely to favour distension. I believe in the wet pack, one ply of sheet under a blanket laid over it. The last thing desired is to produce a sensation of cold and consequent constriction of superficial vessels. One imitates Nature by putting on a sheet wrung out of water, which feels warm to the patient and is kept wet by sponging from time to time as evaporation takes place. Four ply of sheet is half-way towards the hot pack, with the initial disadvantage of possible shock constriction from cold. Cradling at a temperature of 103° F. (speaking now as a patient) is a most uncomfortable process, while the evaporating pack is more efficacious.

On my diet I saw no cases of thrombophlebitis. It may be I produced a calcium deficiency, or that three pints of milk produce a calcium excess—my three-pint colleagues had many cases of thrombosis. I used to get cases of painful toes lasting about ten days, and these began in convalescence; perhaps the increased diet of that period caused them. I am sorry to see the statement that alcohol hardens the skin. Alcohol is serviceable as a disinfectant and to dry the skin; the really important thing the nurse does is to massage the bony areas with a smooth soapy hand, thereby maintaining the local circulation. Speaking again as a patient a bath towel made into a ring pad gives a greater sense of support than does an air cushion. A water bed gives a sense of insecurity.

I am, Sir, yours faithfully,

R. W. JAMESON.

West Wickham, Kent, Jan. 13th, 1930.

ZONDEK AND ASCHHEIM TEST FOR PREGNANCY.

To the Editor of THE LANCET.

SIR,—Further confirmation as to the practical value of the Zondek and Aschheim test for pregnancy, as described by H. Allan and F. Dickens in your issue of Jan. 4th (p. 39), is given by F. Wermbter and E. Schulze, of Berlin, in a paper published in the *Klinische Wochenschrift* (1929, viii., 970). In all their cases the presence of a hormone, held to be anterior pituitary, was demonstrated by characteristic macroscopic changes in the mouse: alteration in the œstrus (anterior pituitary reaction I.), petechiæ in the ovaries (anterior pituitary reaction II.), and corpora lutea atretica (anterior pituitary reaction III.). A brief résumé of their findings is as follows:—

—	Number.	Negative.	Positive.
Normal pregnancy.			
Fifth to sixth week ..	18 } 51	— } 1	18 } 50
Seventh to eighth week ..	16	—	16
Third to tenth month ..	17	1	16
Interrupted pregnancy.			
Fœtus died..	2	—	2
Threatened abortion cured	1	—	1
Extra-uterine gestation ..	4	1	3
Puerperium.			
After normal birth ..	1	1	—
After extra-uterine gestation	1	1	—
After or during abortion..	9	7	2
No pregnancy.			
Amenorrhœa	8	8	—
Retroflexion of uterus, adnexitis	32	31	1

Total: 109 cases, including 2 failures.

Thus, out of 51 normal pregnancies, 50 gave a positive reaction, among which 18 were between the fifth and sixth week. In one woman the urine gave a negative reaction on the thirty-fourth and the fortieth day of pregnancy, but was positive on the forty-sixth. Of the 17 cases in the third to the tenth month, the negative reaction occurred in the ninth month, one week before the birth of a living child—a failure of no practical significance. The negative reaction in one of the four cases of extra-uterine reaction gestation occurred where bleeding had been in progress for five weeks, and operation subsequently revealed a hæmatocele.

In 40 non-pregnant patients tested, the reaction only failed once; where a left-sided inflammatory adnexal tumour was present—in all probability an extra-uterine pregnancy.

I am, Sir, yours faithfully,
GEORGE H. MORRISON, M.B., Ch.B. Edin.
London, S.W., Jan. 8th, 1930.

PROGRESS IN UROLOGY.

To the Editor of THE LANCET.

SIR,—If Mr. Morson reads my paper carefully he will see that I was referring particularly to the work done in Dr. Young's clinic at Baltimore. He will also see that I did not confine my remarks to emanation seeds, but included radium element in small needles. It was not possible in a short account to give details, but the method of treatment under discussion does not entail the retention of the emanation seeds, which are provided with short threads by means of which they can be removed when they have served their purpose. The production of a vesico-vaginal fistula must surely be due to involvement of the vaginal wall by the growth or faulty application of the radium. The good results obtained by Young and his co-workers are there for all to see who have time and inclination to visit his clinic.

I am, Sir, yours faithfully,
Belfast, Jan. 13th, 1930. ANDREW FULLERTON.

COMPLICATIONS OF OPERATIONS FOR PILES.

To the Editor of THE LANCET.

SIR,—In reply to Mr. Morley's letter in your issue of Jan. 4th (p. 53) regarding the report of the last meeting of the Subsection of Proctology of the Royal Society of Medicine, it is true, I believe, that I was the only speaker who referred to the injection method, but Mr. Morley should realise that the subject of Complications of Operations for Piles had been arranged for the discussion, and it was hardly the place therefore for labouring the merits of the injection treatment. I quite agree with the contention that uncomplicated internal piles can be cured by injection, and I am an enthusiastic believer in ambulatory treatment of many rectal conditions. There is, however, a certain small proportion of pile cases that has to submit to operation—namely, the enormous prolapsing piles, fibrous internal piles or piles complicated by the presence of a deep fissure, large external piles or some other lesion. The subject in question, therefore, was a very proper one for a discussion, even though the report has provided Mr. Morley with "a text for the advocates of injection."

Mr. Morley's benevolent welcome of me as a convert to the injection method is somewhat overdue seeing that I have been practising and teaching this method for the last ten years. The teaching has not been in writing, however, but practical clinical teaching carried out regularly at St. Mark's Hospital to post-graduates from all parts of the world. The out-patient clinics at St. Mark's Hospital provide, I venture to say, a wealth of clinical material in rectal work that is unsurpassed in this country, and for many months now I have used the 5 per cent. solution of phenol in vegetable oil by the method of Albright and Blanchard of which Mr. Morley is himself a follower. The results have been so good that I have to recommend operation now in only a very small proportion of the total number of pile cases seen.

As regards Mr. Morley's criticism of the syringe and needle which I have recently described, I must confess that I am not impressed by his unfavourable view of it. In his original article (THE LANCET, 1928, i., 543) Mr. Morley advocates injection of "a large quantity (some 1 to 3 c.cm.)," and in his work entitled "Hæmorrhoids," fourth edition, 1929, he is still more modest, saying (p. 107), "it will usually be found that each pile requires from ½ to 1¼ c.cm. of the oil to produce the requisite degree of distension." Again, the needle which Mr. Morley has described and advocated is only 4¾ in. long, which, when used with a larger syringe, gives very little more effective length than the one I have suggested. Therefore I regard his latest pronouncement of 10 c.cm. dosage per puncture and a 7 in. needle as a straining for a dramatic effect which bears little relation to everyday work. It is the man behind the syringe that counts, and one syringe and needle may be as good as another.

Mr. Morley may be glad to learn that I still have a couple of his needles in routine use at St. Mark's. The syringe that I have described is effective in practice and enables one to inject the solution sufficiently high and in adequate amounts. I have had no need to inject more than 3 c.cm. per puncture, and the syringe is easily refilled when more than a total of 3 c.cm. is required for any particular case. The bayonet fitting for the needle and its wide bore are the essential points which can obviously be adapted, if required, to larger syringes and to needles of any conceivable length and shape.

I am, Sir, yours faithfully,
London, W., Jan. 13th, 1930. W. B. GABRIEL.

THE BRUIT D'AIRAIN.

To the Editor of THE LANCET.

SIR,—Questions of meaning and translation are always interesting, but their solution has a methodological importance. The best way to set about it seems to be to work back from the words to the notions symbolised, and then to the "things" thought about. Now, if Dr. McLaughlin really wishes to cross swords with "Anglo-Gallicus," and *glaives d'airain* are nominated by their seconds, the weapons produced at the *triste rendezvous* in Hyde Park will certainly be Bronze Age relics, made of the predominantly copper and tin alloy that we call bronze nowadays—it was not always called thus, in England. Swords made of the copper and zinc alloy which alone is now called brass will not serve their turn. On the other hand, it is possible that they may be dissuaded from their fell purpose on listening to the harmonious *tintement* from the Lansbury Tower. I say this, because I am told that each bell (or, as a poetical Frenchman might say, *chaque airain*) has been cast in this copper and tin alloy we call bronze. If I am wrong, and these bells are really cast in brass, then, of course, the discord on the grass will be aggravated by the jangling in the air. And the whole evening will end on a "brassy note" very unlike that of any pneumothorax I have ever percussed. But I subscribe myself, very hopefully yours,
Jan. 11th, 1930. GALLO-BRITANNICUS.

To the Editor of THE LANCET.

SIR,—"Anglo-Gallicus" tells us that the name of Laennec should be spelt thus, without vowel-ligature or diæresis, just as are the place-names Caen, Laon, and the like. So the owner of the name wrote it, and so it appears on his statue in his native place of Quimper, Lower Brittany. But it has been the practice for 80 years or more at all events to place two dots over the third letter in order, no doubt, to acquaint the non-gallic reader how the name should be pronounced, and the practice is now so deeply ingrained that it may be well to continue it. Laënnec on this view is the anglicised form of Laennec. "Anglo-Gallicus" does not seem to be aware that Laennec is trisyllabic, whereas Caen and Laon are monosyllabic; current French dictionaries of proper names are quite clear on this. My own copy of Larousse Classique Illustré not only indicates the trisyllabic pronunciation of the name, but puts a diæresis over the first e to ensure it.

I am, Sir, yours faithfully,

Jan. 11th, 1930. BOBO.

LIABILITY TO DAMAGES FOR INFECTION.

To the Editor of THE LANCET.

SIR,—Actions of damages against a medical man are not infrequent nowadays, but a recent decision of the Scots courts seems to break new ground (Carmichael *v.* Miller's Exrs., Dec. 26th, 1929). A paterfamilias claimed £600 from the doctor in charge of the local hospital for causing the death of his daughter by negligently discharging his son while suffering from diphtheria. It was said that there had been carelessness, firstly in failing to recognise a certain development in the course of scarlet fever as incipient diphtheria, and also in any event in sending home a child with an infectious discharge from the ear. The defender was successful on both issues, for the judge held that he had no reason to diagnose diphtheria or to suspect danger from the ear condition. But though he escaped on the facts important legal questions were assumed against him.

It seems never to have been decided hitherto that a medical man was liable to be sued by any third party who might be indirectly affected by his actions. It was always obvious, of course, that he was morally bound to guard the general public against infection, but the existence of a legal duty is a different matter. One might naturally think that his only legal obligation was to his patient or to the person who employed him. This case did not, of course, depend in any way on the tie of blood between the members of the family affected. If a sister has a claim, so has any stranger. The only difference is a practical one that it would be much harder for him to prove the exact source of his infection. It was a pure accident also that it was a relative of both who sued, for the father was a mere figurehead to enable his infant daughter to appear in the Law Courts. The result of it all is that if a doctor by some oversight allows an infected patient to come in contact with others he may be liable in damages to an almost unlimited extent. This is surely a new and startling proposition.

Even without this added burden one must remember that the medical practitioner is badly handicapped in contrast with other professional men. Lawyers, architects, and so forth are not liable to anyone except the person who employs them, because the law does not recognise any duty apart from contract. If a father calls in a solicitor to make his will a child has no redress should his name be carelessly omitted. But if a surgeon sews up a sponge inside him things are quite different. The reason for this unfair distinction is that the law regards physical injury much more jealously than monetary loss. Medical men are thus penalised by the accident that their actions affect persons rather than pockets. The real remedy is, perhaps, not to reduce the liability of doctors but to impose the same standard on other professions.

If the new idea catches on, a rich vein of damages may be opened to a certain section of the legal fraternity. Defenders, however, will always have the advantage as regards the facts. It is, as a rule, difficult to prove that infection has been incurred from any particular source. In this case the difficulty was all but surmounted by special circumstances, and the proof only broke down because no virulent bacilli had been detected in the ear. The family were all young, lived in a small town in the Highlands, and were much at home. Another child also took diphtheria, and no other cause could be suggested, the evidence as to the drains being negative. This was unfortunate, as it may result in future claimants underestimating the obstacles to be surmounted, and in medical men being forced to incur considerable legal costs. One can only hope that these actions will not become as common as those directed against physicians who have reluctantly performed the odious duty of certifying a person as insane.

I am, Sir, yours faithfully,

Jan. 11th, 1930. LEX.

*** *This letter is the subject of comment under* Medicine and the Law.—ED. L.

PSITTACOSIS.

To the Editor of THE LANCET.

SIR,—An investigation on psittacosis is at present being carried out at the London Hospital and I should be grateful if any doctor who has had to deal recently with a case of the disease would communicate with me. I should also be glad if any parrot suspected of conveying the disease could be sent to Dr. Western, Bacteriological Department, London Hospital, E. 1.

I am, Sir, yours faithfully,

ROBERT HUTCHISON.

Devonshire-place, W., Jan. 14th, 1930.

Obituary.

JAMES HOGG MARTIN, M.D., F.R.F.P.S.GLASG.,

PROFESSOR OF MIDWIFERY AND GYNÆCOLOGY, ANDERSON COLLEGE, GLASGOW.

THE death on Jan. 1st of Prof. James Hogg Martin startled a wide circle of friends and patients, for only his most intimate associates were aware of the serious nature of his illness, and they had the hope that, though there might be little prospect of his taking part again in professional life, he might yet enjoy a period of moderate health.

To Prof. Archibald Young, an intimate friend of the late Prof. Martin, we owe the following estimate of the man and his work: "Martin was in many ways a remarkable man—" he writes, from a knowledge extending as far back as their school-days, when they were both pupils of the Glasgow High School, and members of the same form. "He was one of a large family of boys and girls. His older brother and his next younger brother, also high school boys, went direct from school to college, both graduating in medicine with distinction. The older has been for a number of years visiting surgeon to the Cardiff Infirmary; the younger's professional career has also been laid in Cardiff. James, on the other hand, went into business for some years after leaving school, but when already 30 years of age, he also became a student of medicine, graduating in medicine at Glasgow University in 1907. During his student days he began to take part in teaching, acting for two years as a student demonstrator in anatomy

DR. MARTIN.

Notes, Comments, and Abstracts.

CARDIAC INSUFFICIENCY:

THE PRECURSOR OF CARDIAC FAILURE.*

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CARDIAC insufficiency in everyday life probably amounts to shortness of breath or some precordial distress on effort, and is essentially a relative matter. We can all reach such a stage of cardiac insufficiency by over-exertion—e.g., running a half-mile race. In the first place, therefore, we must determine how much effort is required to induce such symptoms. The child can rush and tear about all day long and feel none the worse, while the aged puff and blow on very slight effort. In fact, cardiac sufficiency is merely a measure of physical fitness. The marathon runner only shows these signs after great exertion; the centenarian only avoids them by continual rest in bed. The broken-down heart presents both these signs all the time; it has no cardiac sufficiency at all.

Relative cardiac insufficiency arises when the circulation is unable to fulfil such demands as may reasonably be imposed upon it, having due regard to age, habit, and environment.

(*a*) *Age.*—The physical reserve diminishes as age advances. Football is a good game at 20, hard work at 30, and impossible at 40.

(*b*) *Habit.*—Dock labourers at 40 can endure physical exertion impossible to the cleric, barrister, and physician of the same age.

(*c*) *Environment.*—Vitiated atmosphere, adverse temperature, and unsuitable food all affect cardiac reserve. It is customary to refer such insufficiency to the heart.

The analogy of the circulation to the water-supply of a great city is always irresistible to me. We have heard much in the public press this year about London's water-supply, for it threatened to run short. Our water-supply, primarily derived from the rainfall, is collected into reservoirs and pumped through the supply pipes to each individual house, where it is used for cleansing in one way or another. Every house in London is supplied with water through a pipe. This provision does not necessarily keep the population any cleaner; they must themselves make use of the water in the proper way, exactly as the individual tissues must use their blood-supply in the proper way. When the rainfall fails the supply of water fails, and the best pump in the world cannot feed the pipes with water it has not got. Continuing the analogy, the output of the heart must be determined by its intake, a curtailment of which will cause the best heart in the world to fail. When the water pipes become old they suffer from two defects; (*a*) silting up, so that their bore is much reduced; and (*b*) a liability to burst, especially under stress. If the pump becomes defective and its valves leak, either the supply of water is curtailed or the pump must work harder and faster to maintain the supply. This simple analogy, therefore, offers four possibilities to explain an insufficiency of water-supply or blood-supply, the degree of deficiency being proportionate to the degree of the primary defect.

The Pump.

In considering the pump itself our analogy breaks down to some extent; it is obvious enough that if the pump be worn out and defective, or its valves become broken, damaged or actually destroyed, the pump cannot do its job and the water-supply fails. In this, of course, it exactly resembles the heart, but in the human body there is only one pump, which must do the work adequately for every demand made upon it. When an individual is lying in bed and asleep the demands upon his heart-pump are at a minimum, whereas when strenuous physical exertion is undertaken the demands upon the heart are enormously increased. The difference between the maximum and the minimum response can be regarded as the cardiac reserve. Relative cardiac insufficiency, therefore, is a diminution in cardiac reserve. This reserve power of the heart is best considered in terms of minute volume—i.e., the quantity of blood ejected by the heart per minute. This volume may be increased in two ways: (1) by increasing the frequency of the heart beat; and (2) by increasing the volume of blood thrown out per beat. The first of these is very easily observed; the second in man can only be arrived at indirectly.

Some estimate of the reserve capacity of the heart can be attained by observing in any individual the rise of pulse-rate which occurs in response to a standard exercise done at a standard speed. It is then found that the actual rise in frequency seems to be a measure of physical fitness. As a concrete example, a well-trained athlete will swing up and down touching the toes 20 times in 40 seconds, and show a pulse rise of 60 to 70 beats per minute, whereas an individual out of condition doing the same exercise in the same time will show a rise from 70 to 120 beats per minute. It is probable that the maximum frequency of the normal heart is 160 beats per minute, so that the reserve power remaining to the two individuals after the exercise is enormously different, and would become vastly more marked if the test exercise were more severe. Response to effort is, after all, the keynote of cardiac efficiency; in complete heart failure no effort is possible; the patient suffers a severe degree of distress even when kept completely at rest in bed and is unable to make even the slightest effort unassisted. His cardiac reserve is nil. At the other extreme the winner of a marathon race is endowed with a cardiac reserve beyond that of his fellows which reaches, of course, a very high order.

But the efficiency of the heart as a pump cannot be measured solely in terms of change of speed. There is another factor, the change in stroke-volume, and it is in this respect that the heart is so unlike the water-pump which formed our original simile. The volume of the blood ejected at each cardiac contracture can, and does, vary within wide limits.

Until a few years ago every text-book of physiology quoted Bowditch's law of the heart: that upon electrical stimulation the heart muscle responded either with the full force of which it was capable, or not at all—the "all or nothing" law. The brilliant researches of A. V. Hill have upset all our previous ideas of muscular contracture, and everyone now knows that the force of a muscular contraction is a function of its fibre length up to a critical destruction point. If we may apply that principle to the heart muscle, the force of its contracture will be determinated by the length of its muscle-fibres at the moment. Any lengthening of the cardiac muscle-fibre must, and will, result in an increase in the capacity of the chamber concerned, which will therefore hold more blood. It is important, of course, to bear in mind that muscle has no power of active relaxation and can exert no relaxation force, so that no question of suction in a muscular chamber can arise. There must, therefore, be some force to cause the actual increase of fibre length before this increased force is available. Muscle-fibre in relaxation will lengthen under a minimal force, but some distension force must bring this about.

Now general muscular exertion carries with it two factors: a demand for an increased blood-supply and a more rapid emptying of the veins, pressing the blood back towards the heart. Deepened respiration is another factor which is by no means insignificant. Immediately the return blood volume is increased, the amount taken into the heart in diastole is increased and in turn must and does increase the size of the muscular chamber, thereby increasing the length of each muscle-fibre and producing the one essential factor for an increased force of stroke and increased output volume. I believe that an appreciation of this automatic cycle is imperative for a due understanding of cardiac mechanics. The factor, then, in causing increased force of beat is the relative blood volume; in other words, the cardiac intake. Yet another factor is the force which a given mass of muscle can exert; this is very variable in different individuals and can be improved by training and use, and diminished by disuse and an unhealthy life.

Cardiac reserve, it now appears, may be expressed as the rise in force which accompanies a fixed degree of muscle lengthening, it being obvious that the heart muscle which gives maximum increase in force for minimal lengthening will always show the greatest reserve, other factors remaining equal. Variations in muscular capacity are apt to show themselves very clearly in the heart. The three outstanding processes affecting the efficiency of the cardiac muscle-fibre are: (1) Interference with the nutrition of the heart muscle—i.e., involvement of its blood-supply—i.e., disease of the coronary vessels. (2) Toxæmias: tobacco, possibly alcohol; influenza, and other toxic-infective diseases of which diphtheria is the outstanding example. (3) Inflammation of the heart muscle, as in the course of acute rheumatism, chorea, scarlet fever, and infective endocarditis.

There are two reasons why it is not easy to treat the after-effects of these damaging processes. In the first place, direct treatment to the heart muscle is not possible and any treatment must be indirect. Secondly, the heart is never given any rest: it cannot be put into one of those highly ingenious but far from ornamental glittering contrivances with which every orthopædic department in the country is littered. The inability to keep the heart at rest prolongs the toxic and inflammatory processes and renders recovery desperately slow. Treatment to help the recovery process and to improve the muscular tone must be a general graduated muscular exercise; walking is the easiest and most suitable, at least in the early stages, and is the method most usually adopted. The length of time required, not less than 12 months, is also a factor requiring much consideration and careful management. Once a heart muscle has been damaged by such toxic or infective processes its efficiency is materially reduced. In the terms of our definition: in order to produce extra force the degree of muscle-fibre lengthening becomes greater than normal; hence the fibres are liable to become unduly stretched in the heart's attempt to fulfil its obligations. This, in the old nomenclature, is cardiac dilatation. When to the process of muscle damage are added all the ill-effects of leaking, damaged, or destroyed valves, the nature of the total process becomes even more apparent and more fully appreciated.

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The Defective Pipes.

A faulty pipe may burst, or may become so silted up as to pass only a much smaller volume of water than when it was new. The result of the burst pipe is familiar in that pathetic group of hemiplegics, whose pipes to the master tissue, the brain, have given way, causing widespread damage to the delicate nervous tissue and leaving the patient paretic alike in mind and body, but showing little or no direct effect upon the heart itself.

The silting-up process—arterio-sclerosis—reacts upon the heart in at least three different ways: (*a*) The arteries are reduced in calibre and elasticity, and the actual work done by the heart in forcing the blood through them is definitely increased—in other words, the cardiac muscle-fibres must lengthen to accomplish the task and the heart hypertrophies, or at least becomes longer. (*b*) The arteries deliver less blood to the tissue capillaries, less in fact than they actually need; the tissues in time cry out for more blood and set in motion that neurohormonic reflex which determines the blood-supply to each individual tissue according to its needs; this throws a further effort upon the heart. (*c*) If the coronary vessels, supplying the heart muscle, are themselves involved, the unfortunate cardiac musculature is starved of blood and its nutrition impaired at the same time as it is called upon to make an increased effort, so that further lengthening of fibre is necessary, greater force must be expended, cardiac reserve is encroached upon, and with such a vicious circle breakdown is not far distant.

When we approach the question of the proper use of the blood-supply by the tissues the issue becomes somewhat more complex. The water-supply of London will not keep the population any cleaner unless they wash themselves and their clothes both frequently and efficiently. The blood-supply to a tissue will not save it unless the tissue—to put it simply—can take up oxygen and *get rid of carbon dioxide.* Now damaged tissues are unable to discharge their function, and may thus have a far-reaching effect upon the whole body. As a concrete example, the kidney damaged by an attack of acute nephritis has a much reduced functional capacity. Although adequately supplied with blood, it fails to keep either itself or its body clean. The ultimate result is as disastrous to the body as to the city where members fail to make use of their water-supply.

Drought.

The water pumps of this great city cannot send out water which it has not got, and a drought inevitably embarrasses the water-supply of the whole area. The same is true of the heart. The force of the heart beat can only be increased by a lengthening of the muscle-fibre, and this lengthening must increase the size of the cardiac chamber and can never be an active muscular action. It then follows that no increase in the force of the cardiac cycle can possibly be produced without an increase in the volume intake of the heart. This can only occur under two conditions: (1) the return volume of blood must be increased; or (2) the filling-time of the heart—i.e., its diastole—must be prolonged. Now effort is always associated with a rise in cardiac speed, and the filling-time must, therefore, be shortened and the return volume of blood must be increased. Teaching about the circulation in the past has omitted the very essential factor of how this comes about, and yet it is really a simple mechanical problem.

Ventricular contraction drives the blood into the arteries, pressure being maintained in diastole by the elastic recoil of the larger vessels: thus the blood is forced through the capillaries and is collected up in the venules. Very little positive pressure is left in the vessels when the blood has travelled this far. Muscular contraction compresses the thin-walled veins of the limbs, and the valves with which they are furnished determine a movement of the venous blood towards the heart. In the legs this is accomplished against the force of gravity, so that it must be easier in the arms. In the head and neck gravity helps the return of blood towards the heart, but the abdomen, which contains a high percentage of the total blood volume, does not lie in between contracted muscles, even if its veins were furnished with valves, which they are not.

Once again I must refer to physiological principles, to what is known as reciprocal innervation. It is manifest that a forcible contraction of the flexor muscles of the arm or leg can only be effective when there is simultaneous relaxation of the extensor group, and these paired groups are said to be reciprocally innervated because when one group contracts the other automatically relaxes. The diaphragm plays a very large part in respiration; its descent would be difficult to accomplish were the abdominal muscles held firmly contracted. There is much evidence that a process of reciprocal innervation associates the diaphragm with the abdominal muscles. If this be true, then it follows that when on inspiration the diaphragm contracts, producing a negative pressure within the thorax, at the same time the intra-abdominal pressure is raised to some degree by its descent. Meanwhile the abdominal muscles relax to some extent, so that the great abdominal veins are slightly compressed on the abdominal side while the intrathoracic pressure falls, and blood passes into the thorax. With quiet expiration elastic recoil is usually considered to be sufficient to account for the process, but immediately expiration is at all forced the abdominal muscles come into play and raise the abdominal pressure, thus forcing the diaphragm up into the thorax. Here, then, we have a very definite mechanism tending to return blood to the heart—in other words, to supply blood direct to those venous cisterns, the great veins, which deliver blood direct to the auricles for supply to the ventricles. The act of respiration is a very definite force which during inspiration draws blood into the thorax by negative pressure and during expiration raises the intra-abdominal pressure to the same end, but to a lesser degree.

It is common knowledge that muscular exertion deepens respiration, and that expiration becomes active rather than a mere passive recoil. Here we have again one of those nicely balanced mechanical arrangements with which natural phenomena in the body are so commonly equipped. Effort demands increased blood-supply; muscular contraction speeds up the blood return through the veins; respiration is deepened, increasing the thoracic suction power and raising the intra-abdominal pressure, thus driving the blood from the great abdominal veins into the thorax; the return flow of blood to the venous cisterns formed by the venæ cavæ fills them with blood; more blood passes into the auricle and is sent into the ventricle, thus causing an increased stretching of the ventricular wall, a lengthening of its muscle-fibres, and an increased power of stroke. In this way the output of the heart is increased both in speed and volume, and the tissues are served.

The venous cistern consists of all the great veins—cavæ, innominates, hepatic, and iliac—and is closed by six valves in pairs at the femorals, subclavians, and jugulars. In the lower animals there is a venous sinus, shut off from the auricles by valves, and it is highly significant that as we pass up the animal scale the disappearance of the sino-auricular valves coincides with the development of a diaphragm. There is therefore phylogenetic support for our belief that the return flow of blood to the heart's reservoir is a function of the diaphragm. The size of this reservoir is very great, and its capacity is estimated in man as 1400 c.cm. It can therefore be called upon to give an immediate response when effort is demanded of the heart.

This is not the only force attracting blood to the heart and acting to fill the heart chambers. The pericardium is a strong fibrous bag, and negative intrathoracic pressure can be shown to affect the pericardium and so cause aspiration of blood into the auricle. It probably does not act upon the *ventricle,* the walls of which are too thick and powerful. Further, each time the ventricle contracts and empties itself it must of necessity cause a negative pressure inside the pericardial sac, a pressure determined by its volume output; this ventricular emptying at each systole will automatically tend to fill the auricles, since they are thin-walled, are in diastole, and are enclosed within the fibrous pericardium. These, however, are small forces and are not of such great value in moving large volumes of blood. They probably only act upon the blood quantum in immediate juxtaposition to the auricles.

Cardiac Reserve under Conditions of Valvular Defects.

When the aortic valve becomes incompetent the ventricle contracts and drives a certain amount of blood into the aorta. During diastole a certain proportion of this blood escapes back into the ventricle, which also receives its usual change of blood from the auricles. Thus more blood is pressed into the ventricular cavity, which in turn expands; the muscle-fibres are duly lengthened and an increased stroke-output results. In this way the regurgitant quantity of blood is compensated for, but the heart is working with a longer muscle-fibre; hence when call comes for increased rather than merely descriptive names, for by doing so one is apt, as it were, to embalm a fallacious theory and give it an appearance of life most misleading to the inexpert and the unwary. The term concussion perpetuates the view that the familiar instantaneous traumatic paralysis that goes by that name is due to the brain having been shaken about inside the skull and having sustained some mysterious though happily transient detriment thereby. Judging by the evidence now available and with the proper reservation as to the provisional nature of all scientific statements, it may be asserted categorically that the doctrine conveyed by the word concussion is not correct, and that the state in question is due to the momentary and general anæmia of the brain that accompanies a general distortion of the skull.

THE MIDDLE PERIOD: COMPRESSION OF THE BRAIN.

The next phase in the evolution of the surgery of head injuries brought to its problems the help of the experimental physiologist and was to transform the subject from a largely empirical art into something approaching an applied science. In the latter part of the last century was begun by experimental methods the attack upon the fundamental problems of intracranial physiology with which we associate such names as those of Horsley, of Leonard Hill, of Kocher, and of Cushing. Such work gave us the essential facts about the peculiarities of the cerebral circulation and especially the importance of the venous side, it showed that circulatory disturbance is the chief mechanism by which cerebral symptoms are produced, and it taught us what symptoms are produced and how they are produced by a progressive lesion compressing the brain. All these are fundamental principles and of the most direct practical importance, and yet it must be admitted that they did not result in as much progress on the clinical side as they seemed to promise, or in the general elucidation and simplification of the subject for the student that they really rendered possible.

The comparative failure in the fertilising power of the new knowledge was perhaps in part due to two causes. In the first place the exposition of the new doctrines was apt to seem to the clinician abstruse and remote from practical reality—a difficulty that will be understood by those who have read Kocher's classical monograph. And in the second the subject was so much dominated by the theory of the localised compressing lesion that the student was apt to get the impression that the localised hæmorrhage that lends itself to successful operative treatment was the usual form of head injury with which he would be called upon to deal. Such cases of local hæmorrhage without other serious injury do, of course, occur, and thanks to the experimental school our understanding of them is very full and we can usually recognise and deal with them with brilliant results. But they are rare and form but a very very small proportion of the cases of head injury we meet with in practice.

We see, then, that the surgery of head injuries has inherited from what we have called its middle period, in addition to an invaluable treasure of the principles of cerebral physiology and pathology, a fallacious clinical impression that head injuries are largely a matter for urgent operations which can and should be undertaken in a considerable proportion of cases with reasonable expectations of success. It is the melancholy duty of anyone making a reasoned survey of the subject to discourage this still widely prevalent view.

THE MODERN PERIOD: CONTUSION OF THE BRAIN.

In order to give perspective to this very much condensed survey some notice of the more characteristic features of a present-day view of the subject is necessary. In the interests of simplification this purpose may perhaps be effected by commenting briefly on some three themes each of which may fairly be regarded as typical of the modern surgery of head injuries. These three themes are (1) the simplification of the theory of the subject and its closer relation to clinical actualities; (2) the recognition that the typical cerebral lesion of a head injury is in the nature of a contusion, local or widespread, superficial or substantial or both; (3) the emergence into clinical recognition of the minor and the unresolved contusion as definite entities capable of exact diagnosis and treatment.

The Simplification of Theory.

Expositions of theory that have come down to us from the experimental school contain undoubtedly the principles that are necessary to a practical grasp of traumatic cerebral lesions. Yet there can be few of us but must have been aware, after reading these acknowledged classics, of an uneasy sense that the confused and multitudinous events of our clinical experience have still refused to take on order and significance. Or again, how often have we not felt by the bedside the difficulty of reconciling the supposed precepts of our masters with the versatility of nature in producing symptoms that had no right to be there or in withholding symptoms that we had every claim to expect.

Some of these troubles were doubtless due to the mechanisms of cerebral lesions having been regarded too much as in a province apart and completely sui generis. It is true that the functional relations of the brain and skull are, strictly speaking, unique in the body. Looked at more broadly, however, the two make together merely an extreme case of the encapsuled organ. Viewed as an organ with a capsule completely rigid (to physiological forces of course) the brain is no longer the seat of circulatory mysteries of which the very exposition must be obscure. In an encapsuled organ of the ordinary type such as the kidney the continuous flow of blood is kept up by the capsule being extensible and elastic and permitting an expansion of the whole organ at each arterial pulsation. The rigidity of the skull makes some other mechanism necessary there; this is provided by the presence of a considerable low tension region between brain and skull (broadly speaking the subarachnoid space and the venous channels) which permits the brain to expand with each arterial pulse. This low tension space is just adequate to allow the full normal pulsations of the brain; the tension within it is that of the venous pressure which it constantly follows. Crude as this exposition has been designedly made it gives us an easy explanation of two outstanding anomalies—the normal presence of arterial pulsation in the intracranial veins and the singular extent to which the adequacy of the cerebral circulation is at the mercy of its venous side. It is this sensitiveness to any interference with the venous return which makes a mere bruise of the brain a serious lesion both because of its power of causing symptoms and because of its extreme slowness in resolution. A more striking and less familiar way of stating the same physiological facts is to say that the brain is the only organ in the body which, after injury, must return to exactly its normal size before it can function normally.

While the rigidity of the cerebral capsule is truly unique there is one interesting case of an organ—the testis—which shows a distant approximation to it. Here we find two of the characteristics otherwise limited to the brain—the risk of extreme disorganisation in sequence to a simple bruise and the liability to hernia formation when the organ is swollen and the capsule perforated.

Contusion the Typical Traumatic Lesion of the Brain.

In giving to each of the periods I have called attention to a somewhat arbitrary title, I have added as a sub-title the lesion with which in each particular phase observers have been especially concerned. Present-day views of head injuries leave no doubt that in dealing with them contusion of the brain should occupy this position.

The importance of distortion of the skull in the causation of brain injury has made it clear that in addition to the long recognised direct and polar (or contrecoup) bruising to which the brain is liable under violence, the whole organ is subject to stresses and deformations which must expose its whole surface and substance to damage. After any injury at all severe it is probable that widespread bruising is always present. Such bruising, though not in itself a seriously destructive lesion, gains very rapidly in the gravity of its effects according to the extent to which the parts of the brain in the posterior fossa of the skull are involved. It is contusion here which is perhaps the most common cause of death and the most common cause of ultimate failure in apparently successful operations for hæmorrhage. In every case of severe injury all the clinical manifestations are, as it were, sketched on a background of contusion phenomena of all grades of definition. While contusion is so largely responsible for the gravity of head injuries, it has in comparison with gross hæmorrhage one very favourable character. This is that it can in its very nature scarcely give rise to pressures beyond the order of the venous pressure. It cannot, therefore, produce gross capillary anæmia and the accompanying paralytic states.

Thus contusion rarely calls for urgent operations, and in so far as it is amenable to treatment at all can and should always, at any rate in the early phases, be dealt with by milder measures. The range of severity of symptoms to which contusion can give rise is very wide, and we have now at our command a wide range of remedies none of which we can afford to ignore. Familiar as these now are the list of them cannot be too often repeated, and I give it with the remedies arranged roughly in the order of increasing severity of symptoms to which they are applicable—*rest; posture; hypertonic derivation—(oral, rectal, or intravenous); lumbar puncture; decompressive operation.* None of these measures can we afford to neglect, and each single one of them is at times capable of giving brilliant results.

The Clinical Recognition of Unresolved Contusion.

During the late war there developed a strong and healthy tendency to the general recognition of the fact that many conditions to which a vague organic pathology had long been assigned were actually true psychoneuroses. It is interesting to note that during the same period in the surgery of head injuries a process in exactly the opposite direction was taking place. A large group of clinical phenomena that had previously been assigned to the uninviting chaos of "traumatic neurasthenia" was found to be due to definite organic brain injury in the nature of minor and unresolved contusions of the brain substance.

Not less interesting from the point of view of the theory of knowledge was the fact that as soon as the true pathology of these states was known, their symptoms, which had been regarded as essentially elusive and indefinite, were found to be well defined, capable of exact description, and forming a characteristic clinical picture; here I need remind you only of its three characteristic elements—headache, giddiness, and minor mental changes. It is a common, indeed a very common, result of head injury of any grade of severity. Its development can often be prevented or greatly modified by precautionary treatment, and in its developed state in typical cases diagnosis is exact and treatment efficacious. The unresolved contusion shows itself as an indefinitely persisting but variable elevation of the intracranial pressure. As such its symptoms have that close dependence upon the state of the venous pressure that the studies of the experimental school had proved must be present in such circumstances. The elucidation of this troublesome clinical problem is thus perhaps the latest gift we owe to the distinguished band of experimental investigators whose work through so many years continues to fertilise this difficult and stubborn field. The surgery of head injuries can never be easy or popular, but in its foundation of scientific theory it has a treasure which may well be the envy of every other branch of our art.

LACTIC ACID AND CARCINOMA OF THE STOMACH.

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IT has been usual to be influenced towards a diagnosis of carcinoma of the stomach by three findings in the gastric contents—namely, achlorhydria, foulness with the presence of blood, and the presence of lactic acid. In this paper we do not propose to enter into an historical review, but merely to recount the results of gastric analyses in both malignant and non-malignant cases with special reference to the presence of lactic acid. In a previous publication[1] we have shown that the qualitative tests for lactic acid are unreliable. The problem was attacked from a quantitative point of view, and a method for the detection of lactic acid and its estimation in small quantities was described. We were able to show that 40 per cent. of the resting juices of a series of non-malignant cases contained lactic acid, while the later specimens of the fractional test-meals of the same series showed 36 per cent. to contain this substance. All the cases of carcinoma of the stomach investigated in this series were found to contain lactic acid. These findings threw considerable doubt on the theory that lactic acid is produced specifically through the presence of the carcinoma in the stomach. In one case only was it found possible to isolate the actual lactic acid present as a zinc salt, and the chemical examination of this proved it to be of the inactive variety. This pointed very strongly to a fermentative origin of the lactic acid, and argued equally strongly against its being produced by the metabolism of the cells of either the gastric mucosa or the carcinoma; for, if this were so, we should expect to find lævorotatory acid—namely, sarcolactic acid. It was pointed out that this was an isolated observation, and that work was in progress on other cases of carcinoma in order to verify this fact.

The objects of the present communication are as follows: (*a*) to determine the type of lactic acid produced in a series of cases of carcinoma, and thereby to trace its origin; and (*b*) to confirm or refute the statement that lactic acid can be produced very rapidly in the stomach. This is important because rapid production would appear to argue against its origin by fermentation.

Method.

All the patients were examined by the fractional method of gastric analysis. Two charcoal biscuits were given at 10 P.M. on the night before examination. After withdrawal of the resting juice, the stomach was washed out by the injection of water down the tube, followed by aspiration. Lactic acid was estimated by the method already described,[1] and the zinc salt was isolated according to the technique of Warburg.[2] The zinc salt was examined for its rotatory power, its water of crystallisation, and its ash content (ZnO).

Results.

(*a*) *Type of Lactic Acid.*—The patients investigated were seven in number, and included five cases of proven carcinoma of the stomach and two cases in which this condition was definitely excluded. The results are given in Table I., where it will be found that the lactic acid in every case was of the inactive variety, which points very strongly to a fermentative origin.

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[1] Dodds, E. C., and Robertson, J. D.: Quart. Jour. Med. January, 1930.

[2] Warburg, O.: Uber den Stoffwechsel der Tumoren, Berlin. 1926.

TABLE I.—*Showing Properties of Lactic Acid Isolated from Gastric Juice.*

Case No.	Rotation.	Water crystallisation.	ZnO %.
1	0	18·2	35·7
2	0	18·2	33·4
3	0	18·9	33·2
4	0	18·1	33·6
5	0	18·1	33·7
6	0	—	—
7	0	18·1	33·4
Lævo Zn. lactate.	$\left[\alpha\right]^{20}_{D} -6{\cdot}8$	12·9	33·4
Dl. Zn. lactate.	0	18·2	33·4

(*b*) *Obstruction and Lactic Acid.*—Table II. summarises 12 cases of gastric carcinoma, showing the lactic acid in the resting juice. All cases had achlorhydria. It also states whether the patient had obstruction or not, the diagnosis of obstruction being based on either the radiological findings or the fractional test-meal. It will be seen that the cases with obstruction had a very much greater quantity of lactic acid than those without. Where, however, there was no stenosis, the amount of lactic acid was often less than that found in some of the non-malignant cases reported in this and in our previous paper. It is felt that this is still further evidence in favour of the fermentative theory for the origin of lactic acid.

Rapidity of Production of Lactic Acid.

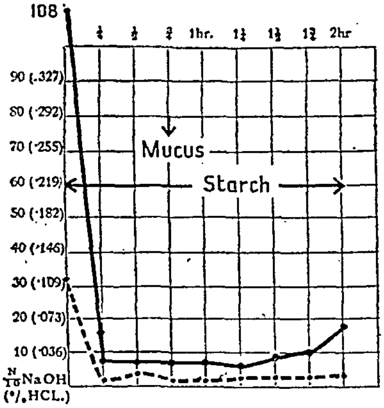
The foregoing results seem to establish almost beyond doubt that lactic acid in the stomach is produced by fermentation. Only one argument against that theory remains to be overcome—namely, the statement of certain workers that lactic acid may be produced very rapidly in the stomach. It is declared by some that if the stomach of a patient with carcinoma is washed out, lactic acid will appear in appreciable quantities within half an hour of administering the test-meal. If this were true, it would throw a good deal of doubt on the fermentative theory; and it will be seen that our earlier cases appear to support the statement. Thus in the cases illustrated in Figs. 2, 3, and 4 appreciable quantities of lactic acid are produced towards the end of the test-meal, despite the fact that the stomach was washed out with water immediately after collecting the resting juice. It will be noticed, however, that the much-referred-to "disparity" of the later specimens is nothing like so marked as in cases published by other workers. We believe this is due to careful washing of the stomach, and we formed the idea that the greater the care taken in washing out the stomach, the less would be the disparity in the later specimens. A careful inspection of the stomach removed from one of our patients in the post-mortem room indicated the extreme difficulty of washing out such a stomach by the ordinary method. It contained a large growth which formed recesses and pockets which would be inaccessible to the ordinary washing out process. It was easy to see that during the later stages of the meal these pockets and recesses would discharge their contents into the main pouch of the stomach, with the result that lactic acid would appear with considerable rapidity, and thus lend support to the argument that it was secreted.

TABLE II.

Case No.	Age.	L.A.*	Obstruction.	Case No.	Age.	L.A.*	Obstruction.
1	53	0·111	Present	9	53	0·550	Present
2	62	0·640	,,	10	47	0·012	Absent
3	57	0·825	,,	11	49	0·005	,,
4	62	0·645	,,	12	37	0·020	,,
7	57	0·950	,,	13	60	0·051	,,
8	41	0·010	Absent	14	57	0·009	,,

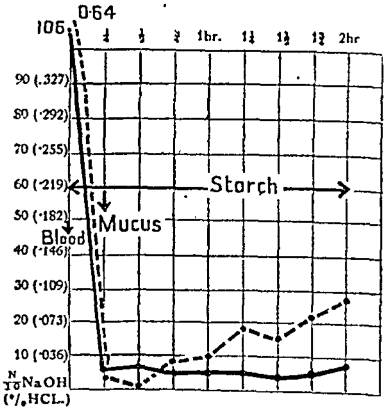
* L.A. = Estimation of lactic acid in resting juice after 12 hours fast in g. /100 c.cm.

FIG. 1.



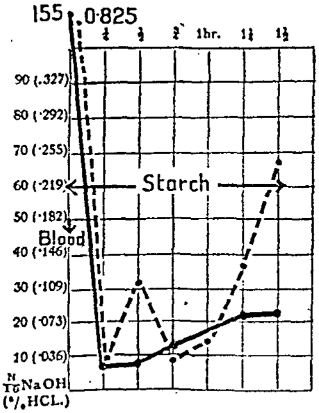
CASE 1.—Carcinoma ventriculi. Resting juice: volume 370 c.cm., odour foul, charcoal present, blood present. Residue: 370 c.cm. at end of two hours.
N.B.—In this and subsequent figures the continuous lines represent total acidity, whilst the dotted lines (figures in decimals) represent lactic acid.

FIG. 2.



CASE 2.—Carcinoma ventriculi. Resting juice: volume 650 c.cm., odour butyric, charcoal present, blood present. Residue: 250 c.cm. at end of two hours.

FIG. 3.



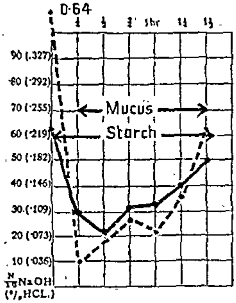
CASE 3.—Carcinoma ventriculi. Resting juice: volume 650 c.cm., odour foul, charcoal present, blood present.

It was decided to investigate the next patient by a special method with a view to washing the stomach as clean as possible. By the ordinary technique of injecting water down a tube and aspirating it, it was found impossible to reach a point at which the washings were absolutely free from starch and lactic acid, therefore it was obvious that this method had to be improved. A series of experiments showed that very efficient washing could be obtained by getting the patient to swallow two tubes, down one of which an assistant injected warm water, whilst the operator aspirated continuously at the other tube. By repeatedly altering the position of the tubes—by pulling them up and asking the patient to swallow them again—it was found possible to wash out the stomach very thoroughly indeed, and after continuing this vigorous treatment for 1–2 hours, and using from 6–7 litres of water, it was found that the washings were absolutely clear and gave no reaction for starch or lactic acid. This method was applied in the case illustrated in Fig. 1, and the chart shows that the resting juice contained a very large quantity of lactic acid with a very high total acidity. After collection of the resting juice the stomach was washed out by the technique described, and it will be seen that the later specimens of the fractional test-meal contained very little lactic acid. This disproves the statement that this substance is produced very rapidly, even after washing out the stomach. It remains, however, to corroborate that the high concentration of lactic acid in the resting juice is due to fermentation and is not produced through secretion. This problem was attacked by taking the same patient and washing her stomach out very carefully by the two-tube method at 7 o'clock one evening. This was done until the washings were absolutely clean as described. At nine o'clock the next morning a tube was passed and the resting juice was collected. The analysis of this specimen was as follows :—

Volume ..	70 c.cm.	Bile	Positive
Odour ..	Normal	Free HCl ..	Absent
Blood ..	Positive	Total acidity	6·5 c.cm. N/10*
Mucus ..	,,	Lactic acid ..	0·006 g.*

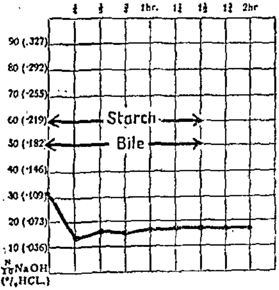
*per cent.

FIG. 4.



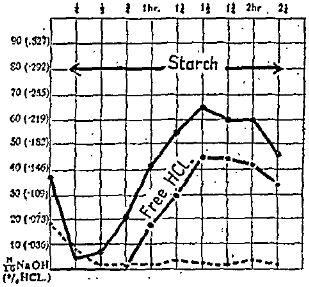
CASE 4.—Carcinoma ventriculi. Resting juice: volume 650 c.cm., odour foul, charcoal present, blood present.

FIG. 5.



CASE 5.—Chronic appendicitis (laparotomy). No lesion of stomach. Resting juice: volume 74 c.cm., odour foul, charcoal present, blood absent, bile present. Residue: 220 c.cm. Resting juice and stomach washings: Lactic acid estimated at 0·076 g. per 100 c.cm., 140 c.cm. gave 0·11 g. zinc lactate. Water of crystallisation, 18·1 per cent.; ZnO, 33·7 per cent.

FIG. 6.



CASE 6.—Migraine (stomach normal on repeated radiography). Resting juice: volume 200 c.cm., odour normal, charcoal absent, blood absent, mucus present.

It will be seen that it is in every way unlike the resting juices of the cases of carcinoma of the stomach, for the volume is relatively small, there is no foulness, and although free hydrochloric acid is absent, the total acidity is only 6·5 c.cm. N/10 per cent., as against 108 c.cm. N/10 per cent. on the previous occasion, whilst the quantity of lactic acid is extremely small. We were able to confirm this observation in Case 7. His stomach was washed out by the same technique at 7 o'clock one evening, and the resting juice was collected at 9 o'clock the following morning. The following is the result of the analysis:—

Volume ..	20 c.cm.	Free HCl ..	Absent
Odour ..	Normal	Total acidity	7 c.cm. N/10*
Blood ..	Positive	Lactic acid ..	0·008 g.*
Mucus ..	,,		

*Per cent.

It is felt that these observations completely prove the claim that lactic acid in the stomach is produced by fermentation and not by secretion. It is, therefore, justifiable to consider the rapid appearance of lactic acid after washing out the stomach to be solely due to inefficient washing, with the result that lactic acid, &c., enters the main stomach from the various crevices and pouches formed around the growth.

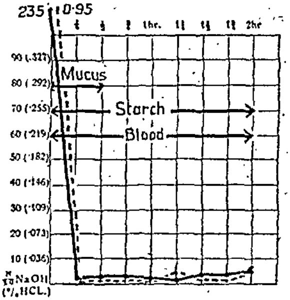
Summary and Conclusions.

1. Examination of a further series of cases has confirmed the opinion set forth in a previous communication, that lactic acid is found in non-malignant diseases of the stomach as well as in carcinoma.

2. The lactic acid in seven cases has been isolated in the form of a zinc salt, and by chemical analysis has been found to be of the inactive variety. This applies to non-malignant as well as malignant cases, and supports the fermentative theory for its origin.

3. The only remaining difficulty in the way of the fermentative theory is the claim by many workers that lactic acid is secreted very rapidly even after washing out the stomach. Evidence is brought forward that it is very difficult to wash out the stomach of a patient with carcinoma properly, owing to the number of crevices and pockets around the growth. If, however, the technique described in the paper with two tubes be employed, it will be found that the amount of lactic acid in the latter specimens of the test-meal is negligible, and the total acidity is very low. These observations would indicate that the lactic acid is not secreted rapidly, but appears in the test-meal in appreciable quantities only if the washing has been insufficient and stagnant contents enter the main lumen from the various recesses and pockets around the growth.

FIG. 7.



CASE 7.—Carcinoma ventriculi. Resting juice: volume 760 c.cm., odour foul, charcoal present, blood present, mucus present. Residue: 240 c.cm. at end of two hours.

4. If the stomach of a patient with carcinoma be washed out (by the technique described) on the night before the test-meal, it is found that the resting juice collected 12 hours later contains practically no lactic acid. This is evidence that neither the stomach mucosa nor the growth are capable of producing lactic acid by themselves even in 12 hours. It is interesting to note that there is no evidence of foulness in the resting juice of patients so treated.

5. If the lactic acid content of the resting juice be contrasted with the clinical and radiological evidence for obstruction, it is found that the lactic acid content is very much greater in cases with obstruction than in cases without.

6. It is felt that these observations prove that the lactic acid is produced through a fermentative action combined with pyloric obstruction, and is, therefore, of little or no diagnostic value for carcinoma of the stomach. In support of this it is found that the lactic acid content in cases of carcinoma with no obstruction is often less than that found in non-malignant diseases.

It is a pleasure to acknowledge the kindness of Dr. G. E. Beaumont and Dr. T. Izod Bennett, who gave us permission to investigate their patients. We have to thank Mr. E. J. Gallimore for assistance in the analysis of specimens, and in preparation and examination of the zinc salt. We also wish to express our gratitude to the Halley-Stewart Trust Fund, which provided the apparatus, and a considerable amount of the assistance, for this investigation.

THE HUMAN MACHINE.

ITS EFFICIENCY AND LIMITATIONS.*

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I AM interested in myself, my machine, because it is mine. Moreover, as a medical man I am occupied in assisting to maintain the efficiency of machines; to ascertain causes of a breakdown; to recommend such repairs as I think likely to restore efficiency completely or to the best of the potentialities of the material. In some respects the doctor is the mechanic at a garage, but with this difference, of course. The mechanic being a workman can repair machines made by workmen like himself; only Nature can repair the Nature-made machine.

A Comparison with the Internal Combustion Engine.

I propose to attempt some comparison of the human machine with the internal combustion engine, but with the full realisation that the analysis must not be pressed very far. As soon as one reaches purely vital phenomena comparisons must break down; and in the case of the human being, additional complexity is introduced by the highly organised nervous system with its necessary frailties, its likes and dislikes, its whims and fancies, its hopes and fears. Nevertheless, I think this attempt should deserve your sympathy partly because we are not in serious philosophic contemplation this evening, and partly because I regard it of value for people occasionally to consider their bodies from a mechanical aspect.

To this extent, at any rate, analogy holds good. Inefficiency in the motor-car is often the result of faulty construction; inefficiency in the human machine may similarly be fundamental. In both human and mechanical machinery a construction originally satisfactory may be damaged, more or less irreparably, by neglect or misuse. And, finally, both are under the influence of environment: variable road surfaces in the case of the motor-car; a multitude of conditions in the case of the human machine.

That these strictly analogous circumstances are not generally realised is the everyday experience of the doctor compelled to encounter many unreasonable complaints and expectations.

Recently a physicist has taken it upon himself to reproach the medical profession because of its inability to prevent heart disease or provide better aids to defective eyesight than spectacles or more efficient attempts to cure deafness. This physicist is an expert motorist, and he ought, therefore, to appreciate the difficulties of those who minister to human machinery, since he is confronted with similar propositions in his own sphere. What would he think of a complaint that an engine put together out of originally defective material which had undergone a severe injury to its lubricating apparatus and the design of which was more appropriate to a commercial than a racing chassis, was incapable of climbing a test hill on top gear, or of running for 200 miles at 40 miles an hour without an involuntary stop? Or of a request to perform some sort of operation upon a tyre which had been in continuous use for 15,000 miles over rough surfaces, and restore it to the condition in which it left the works?

To compare vital issues with non-living material is to some minds repugnant in any circumstances. To others the comparison is only too welcome. There is one type of mind which thinks statistically and believes that the wonders of the human machine can be best conveyed by some such statements as that the blood-vessels of the lung if stretched out in a line would extend half-way to the moon; or that the red corpuscles if laid out flat would form a carpet so many inches wide and so many miles long, a form of measurement which to me personally has no significance whatever. There is another type of statistics, a sort of contemptuous materialism, in which the components of the human body are estimated in the following homely fashion. An average man's body weighing 10 stone is composed of enough water to fill a 10-gallon barrel, enough fat for seven bars of soap, carbon enough for 9000 lead pencils, and phosphorus enough to make 2200 match-heads; magnesium enough for one dose of salts, iron enough to make one medium-sized nail, lime enough to whitewash a chicken-coop, and sulphur enough to rid one dog of fleas. The whole at post-bellum prices could be purchased for five shillings. And the same statistician might have completed his summary by pointing out that it was much the same whether the body in question was that of a village idiot or of an Einstein.

Human and Animal Achievement.

Fortunately for one who would be horrified at the idea of attempting to consider the almost unlimited capabilities of the human machine on the intellectual side, this aspect of the matter is unnecessary in the present consideration. But it is easier and not without interest to enumerate some of man's achievements on the physical side in which connexion he may logically be regarded as a machine. Now admittedly things of flesh and blood cannot compete with non-living machinery; man, too, comes off badly in comparison with many of the lower animals. The development of the large brain together with the assumption of the erect attitude put man at many mechanical disadvantages. The wonder is that in the circumstances his achievements are so noteworthy. Man, in his choice for comparisons, pays deference to the lower animals, not merely on the physical but on the mental, and even the moral, platform—indication of his protean qualities. And it must be claimed for him that, whereas his specialised functions have in some respects been severely detrimental to his physical possibilities, man is still capable of some remarkable performances. One remembers that, although the cheetah is credited with a speed of 60 miles per hour, a velocity equalled by the greyhound, and that a horse has achieved approximately 40 miles per hour, few animals can beat a crack sprinter at his fastest—travelling 11·42 yards per second—23·3 miles per hour.

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* An address delivered to the Guild of Public Pharmacists on Jan. 22nd, 1930.

At longer distances, man's capability becomes even more conspicuous. He has run 112 yards short of 12 miles in the hour; 100 miles in less than 14½ hours, and in a "go-as-you-please" six days' contest has covered 624 miles, a feat which no horse could achieve. One has also to record the remarkable record of 3422 miles in 573 hours during the race across America in 1928. It is difficult to obtain reliable statistics of jumping capacities of animals not specially trained, but 8 ft. 2 in. appears to be a horse's record high jump, so that man's 6 ft. 8¼ in. is highly commendable. The horse's long jumps recorded are often apocryphal, but man we know for certain has cleared 26 ft.

Feats of endurance of the human machine are a striking tribute to the quality of the material and the adequacy of the lubricating system. It has been recorded that the piano has been played continuously for 120 hours, and one hardly knows whether this is a more remarkable achievement than swinging Indian clubs for the same length of time. The human machine, unsuited as it is for an amphibian existence, has swum for over 27 hours during a successful Channel swim. And whilst a record for staying under water for no less than six and a half minutes has been doubtfully claimed, there can be no question that four and a half minutes has frequently been achieved.

All sorts of tests of endurance may be and have been devised in a fantastic search after records. In this connexion one may mention the records of fasting men, whether as a music hall event or as a protest against political or legal coercion. But it is profitless to speculate upon the extent to which a machine, whether human or otherwise, may deliberately be abused and injured.

Sex Differences.

One must at this stage be prepared to say a few words upon the differences between man and woman as a machine, a subject of immense complexity on the psychological side and therefore temptingly appropriate in its reduction to something approaching fundamentals when anatomy and physiology are considered. It is perhaps unfortunate that in this respect conclusions must inevitably be based upon inadequate evidence. Protagonists of violent exercise for women are over-ready to compare the capabilities of the best woman with the average man, very much to the latter's disadvantage. We cannot compare the average man with the average woman, because the average woman does not supply material for this physical consideration, but we can utilise for the present argument the best achievements of each.

A record-breaking young woman has, during the course of a 100 yards race, attained a maximum velocity of 19·4 miles per hour (man's highest speed 23·3 miles per hour). Incidentally, it is interesting to reflect that sex does not appear to affect the physical capabilities of quadrupeds for the speed of the female equals that of the male. Woman's record high jump is 5 ft. 3 in.; her best long jump is 18 ft. 8 in.—i.e., considerably inferior to man's best, but far above man's average. Feats of endurance for women are deprecated, somewhat illogically for there is no reason to suppose that woman is less adapted than man in this respect. On the contrary, she appears to be capable of enduring moderate physical hardship of long duration better than man. The exploits of women as channel swimmers have only to be recalled in this connexion; women mountain climbers have almost equalled men in their accomplishments, and I believe that a female Arctic expedition would be eminently successful. Young women's cross country clubs are now commonplace, though long distance running is, on the whole, discouraged. One girl has been credited with the ability to run over the Marathon course of 26¼ miles in 3 hrs. 40 mins. 50 secs., a feat which I am disposed to doubt, though I do not doubt the possibility.

The Fuel.

In comparing the human machine with an internal combustion engine, and seeking analogies for the various parts, one's progress is at first smooth for one's similes are logical. The motor-car utilises the vapour of petrol as a source of energy. Petrol is selected because it is a readily oxidisable fuel, and regarded as a foodstuff is, so to speak, predigested. The motorist knows that there are grades of spirit, some promising (often with truth) to yield more power than others. The fuel of the human machine, from whatever source derived, is ultimately an easily oxidisable substance, glycogen; and whereas the petrol engine has no palate and establishes as a primary demand only that its fuel shall be clean and free from sediment, the human machine is more discriminating; and even if the ultimate source of energy be the same, the materials from which it is derived may and must vary considerably. It is not always realised that different human machines require different varieties of fuel. For strict comparison with the petrol engine we should visualise man as an ideal machine only when he becomes an ethereal mortal living on nectar, when his alimentary canal would be reduced to the condition of the feed-pipe of the motor-car. It is easy to supply reasons why this conception of man will never be realised. The whole food question must be bluntly dismissed in a thesis dealing solely with human machinery. For, reduced to fundamentals, the food supplied as fuel to the human machine is that stored up in the petrol tank, having been elaborated from the variable raw materials presented to it for digestion. This specialised part of the machinery has, in a way, nothing to do with its ultimate efficiency. The essential is the preparation of the fuel and the raw material from which it is prepared varies with the individual. From this we understand the fallacy of dogmatism—one individual will utilise as an optimum, raw material which would be inadequate, and even harmful, to another. Men capable of achieving first-class athletic results upon what may charitably be called freak diets, are too prone to suppose that their experience is not merely individual. And so adaptable are the human laboratories that the diet question is really insignificant so long as ordinary sensible regulations based upon the past experiences of many generations are followed.

Even at the present day a battle is perpetually being waged on the question of the best diet for physical exertion, and many old traditional ideas become translated into the terminology of vitamins and other modern discoveries. If there is one generalisation which may be permitted it is to allow the appetite and tastes of the individual to follow their natural inclination, and to deprecate Procrustean measures of any kind whatever.

Its Utilisation.

And now in our consideration of the fuel problem in our comparison of man and motor we encounter an essential difference in the method of utilisation.

In the motor-car, petrol is fed from the tank to the carburetter, where it is prepared (by admixture with air) for oxidation, and then passes to the cylinders. This suggests the passage of food to the stomach where it is prepared for assimilation and passed to the active tissues. But whereas in a petrol engine oxidation precedes work, in a muscle work precedes oxidation. The muscle may be regarded as a storage battery working on energy previously stored. Contraction breaks down sugar into lactic acid, which, by subsequent oxidation, becomes carbon dioxide and reconverted sugar and glycogen. And whereas in violent exercise a certain amount of lactic acid remains in the muscles to be oxidised at rest, the provision of an adequate supply of circulating blood with oxygen is indispensable through the arteries (the inlet valves) into the muscles (the cylinders), and out by the veins (the outlet or exhaust). Just as the bore and stroke of the cylinder determine to a great extent the power of the car, so the efficiency of the muscles makes the human machine a good or a bad athlete. But with living tissue there is quality as well as quantity. The muscles of a naturally gifted highly trained athlete possess special qualities—for example, better contractility and the capacity to tolerate lactic acid, qualities which are not easily described in terms of mere machinery.

For oxidation ignition must occur. In the human machine the magneto is the brain which, notwithstanding its complexity of working in relation to the whole mechanism, may for simplicity be regarded here as purely a means of ignition. From it impulses pass down the nerves (copper wires) to the terminations in the muscles (sparking plugs). The man who can run or row or perform any well-coördinated act is the man-machine with a perfectly timed magneto. And whilst such timing is to a large extent his natural heritage, training for athletics is an education of the brain to send out the proper impulses.

The blood (in addition to its other qualities) is the lubricating oil, and the heart is the pump. The radiator is obvious; the whole of the body is the human radiator exposed as it is to surrounding media, and keeping the engine cool by evaporation from the surface. With excessive heat production the radiator boils—that is to say, the human machine perspires.

The transmission, gears, and wheels are comprised in the tendons, joints, and bones. Legs are a sorry substitute for wheels in some respects, but they are admirably adapted for the large variety of purposes they are called upon to fill. Broadly speaking, the human machine has a fixed gear, one depending upon the relative proportions of the parts of the lower limb, and particularly on that of the heel to the front pillar of the foot. If we could alter the length of the heel at will we should possess a variable gear. We find that in the sprinter the front pillar is relatively long, so that the leverage gives great power to the calf. In the long distance runner the relatively long heel gives less leverage but a better sustained effort—a short stride with proportionately little exertion.

Admittedly all these analogies are very elementary; scope for amusement, perhaps, rather than instruction. Any attempt to delve deeper discovers the complicated laboratories of the human machine for which there is no parallel. It is a coördination of units, it is built like a machine, but it has the organisation of an army. Yet again I say there is some advantage in thinking mechanically, if only to appreciate the value of keeping the machine clean, of preventing unnecessary friction of the bearings, of avoiding overloading or overheating, and of attempting to select the type of machine for the work required.

Advantages and Drawbacks of the Living Machine.

The living machine must work at certain disadvantages. Given the proper rate, proper load and proper lubrication, one hour in the day is as good as another for the non-living machine. Man is a diurnal, not a nocturnal animal; and furthermore a motor, save by gross misuse, does not necessarily become tired; fatigue of living tissue is, of course, inevitable. In this respect let us return to seek some more elementary analogies. The human machine enjoys the advantage that it does not wear out in the fashion common to ordinary machinery. On the contrary, it is constantly renewed, and so far from depreciation, improves with use for a number of years, until the only really perishable part, the magneto, wears out. Even if the paint becomes scratched—blisters on the feet—the paint is gradually restored spontaneously, without trouble or expense, to its pristine excellence.

Yet again one is tempted to further, perhaps dangerous, analogies. It was amusing and interesting to witness during the "Veterans' Rally" on the Brighton-road the spectacle of a 30-year-old puffing and wheezing its way along, not a single part of it without a defect of some kind, but still proceeding under its own power. It passed by the roadside a magnificent £3000 modern representative, temporarily immobilised, in all its pride and perfection, by some such trifle as a loose electrical connexion, or a tiny piece of grit in the carburetter jet. So, I reflected, it is with the human machine. We see a body in the last stages of a mortal illness in which practically every organ is the seat of disease and more or less impaired function, but in which life continues with an intelligence completely unclouded. With this we contrast the man in rude health, suddenly smitten down by a clot in a vessel supplying a vital area, or some other trifle almost ludicrous in its terrible capacity for turning life into death. Some years ago a man was brought into this hospital dead. Examination and inquiry into antecedent circumstances revealed the following. In leaving a public-house he injured his hand in the swinging door. Instinctively he applied his mouth to the injured part and inhaled a small piece of skin which had been abraded straight into his larynx with the production of spasm of the vocal cords and death. The history of medicine is full of examples of the most trivial injuries being responsible for sudden heart failure. Unfortunately, analogy breaks down at this stage; the motor-car may be restarted; life, once arrested, is arrested for ever.

"*A Fat Spark.*"

Apart from loss of power through physical causes identical with those which may affect the petrol engine, the human machine has the additional disadvantage that the magneto may, through purely emotional causes, fail spontaneously to work efficiently and provide a "fat spark." Such functional consequences, no matter upon what they must ultimately depend, to a great extent determine human efficiency. In motoring terms, a soiled magneto or missing plug; in medical language, brain fag or neurasthenia. Much may be said in admiration of the perfect timing mechanism which in a motor-car arranges the opening of the inlet valve and the closure at the precise moment when the compression stroke is completed with the remarkable rapidity necessary for great velocities. And yet what is such a mechanism compared with the human machine? When walking four miles an hour, only half a second elapses from the time the heel is raised until the limb has swung forward and the foot is again planted on the ground. Yet in that half second, 54 muscular engines have been started and stopped, speeded up, and slowed down a countless number of times. And this is the merest trifle compared with the performance of a crack high jumper. Think of the mechanism controlling the complexity comprised in such a series of directions as these. "The left foot is brought up level with the bar; the right leg is kicked out towards the right and is then cut in under the left leg, whilst the jumper should then give his hips a wriggle upwards, completing the movement by kicking the right heel up behind the body and swinging the left arm over and down." And the time during which the entire series of coördinated movements is completed is four-fifths of a second!

Selection for Special Purposes.

A feature of practical importance which frequently comes up for discussion is the ability to recognise types which are suitable for particular purposes, a criterion which would be of overwhelming importance in all branches of human activity. We know that many human machines are clearly unsuited for the vocation to which they have been committed through tradition, sentiment, caprice, necessity, and so on. But again it is necessary to limit oneself strictly to the physical side, and apply oneself first of all to the principle of the motor-car receiving its periodical overhaul, a principle which is reproduced in the occasional recommendation that a medical examination at intervals is a precaution which may prevent premature breakdowns. The underlying idea is good enough, no doubt. The engineer oils and greases and cleans and so provides for absence of friction in any of the moving parts. He tightens all loose bolts and nuts, and replaces all defective parts by spares. Should there be a lack of power, he will locate the seat of the trouble, and remedy a defective magneto and its connexions, arrange a more suitable mixture for the engine, or loosen a binding brake. To a certain extent the doctor can offer analogies both as regards diagnosis and treatment, but his difficulties are increased by the complexity of diagnosis and the impossibility of replacing defective parts by spares. It is fortunate that Nature carries her own spares and automatically replaces worn-out parts until the mechanism itself wears out, when senility begins.

A binding brake may have its equivalent in the relative deficiency or excess of one of the ductless glands; though when lack of power sets in, the identification of the part responsible is complicated by the occurrence in human machinery of the functional disorders to which I have already referred, disorders which are unaccompanied by organic change and give rise, as we say, to no physical signs, but may be responsible for symptoms equal in magnitude to anything produced by serious disease. Perhaps in this connexion the only approach to mechanical analogy would be the introduction of a super magneto specialist.

It is conceivable that such a periodical examination might reveal to the trained eye some superficial manifestation of an apparently innocent character, in reality a very early appearance of a serious disease. But as regards internal disorders and serious constitutional disturbances, these do not necessarily advertise themselves externally nor by symptoms any more than grave internal trouble in the petrol engine which, however imminent, may be quite unsuspected until the bearing seizes or the shaft breaks.

I cannot help thinking that the man who wants to subject himself to regular examination is the equivalent of the fussy owner-driver, who wants to take excessive care of his car and is perpetually taking the engine down to discover the origin of some supposed abnormality, or even to reassure himself that all is well. And exaggerated caution must surely lead to morbid imaginative notions equivalent to keeping the car in the garage instead of on the road.

Super-Performance.

One witnesses many attempts to explain the capacity of the super-athlete. The possession of a special and sometimes peculiar proportion of the limbs or of a distinct musculature or even quality of muscle tissue is sometimes invoked. These are obvious explanations, and have a limited application. In our analogy with the petrol engine they would refer to the size of wheels and the gear ratios. As would be expected, a multitude of hypotheses are built up on dietetic considerations, and if a great athlete happens to have some queer prejudice in that respect, it is not surprising that he has a large following, and equally not surprising that the disappointments of his imitators are numerous.

The existence of a "wonderful heart" is sometimes proclaimed, always by an authority who has not the responsibility of showing in what respects the heart differs from that of thousands of other very ordinary athletes. The real explanation is simply that everything necessary in the construction of the machine is just right at the right time. And, after all, the difference which makes all the difference where super-performances are concerned is exceedingly small. Two-fifths of a second separates a great sprinter from the good sprinter, a difference of only 4 per cent. In intensive competition, 1/100th second is a determining factor; about four inches at the end of a race, and here one is in the region of only 0·1 per cent.

It would be far different if one were confronted with a man who would on present standards be in the class not of superman but superhuman. The appearance, let us say, of one who could run not 5 per cent. but 30 per cent. faster than anyone in history, or of one who could cover in an hour not 12 miles but 15 miles, or who could jump not 6 feet 8 inches, but 8 feet. We should then be compelled to look for some really special feature, either a peculiarity of muscle substance or an entirely strange biochemistry. But until that phenomenon arrives there is no need to seek the mysterious or fantastic.

So far as investigations into the physiology of the subject lead us, A. V. Hill says that velocity is not a question of exerting greater propulsive power but of low viscosity—i.e., lessened internal friction—of muscle. Endurance he has explained as dependent upon oxygen-supply and the capacity to tolerate fatigue products. As Hill puts it, the oxygen inspired during effort is income, and upon income no athlete can live. The lactic acid accumulating in the muscles as the result of insufficient oxygen income is the security for the oxygen debt—i.e., the oxygen subsequently used for oxidation. And so long as the security remains adequate, by so much may the expenditure of oxygen exceed income.

From these considerations we see that the natural capacity for exertion depends upon a number of factors. The oxygen income must be high—i.e., the heart and circulation generally and lungs are of the highest efficiency. The oxygen requirement must be economical—i.e., not extravagant nor wasteful through purposeless movements. The security for incurring a large oxygen debt must be good, and this is a factor inherent in the muscular fibre itself, but capable of improvement by training. And all of this seems delightfully simple in the laboratory. It will explain capacity up to a certain point; it will not explain some extraordinary discrepancies. For what no considerations of machinery, of chemistry, or of physics can explain is the will power and what is bound up with it, the reserve which is beyond measurement.

It is impracticable to perform experiments upon men in circumstances of extreme stress; and what cannot be measured is the willingness to submit to complete exhaustion, willingness which must vary in the same individual on different occasions and be influenced by a large variety of factors so that on one occasion he is prepared to fill the unforgiving minute with 60 seconds worth of distance run and on another his form is surprisingly bad.

We may congratulate ourselves that the efficiency of human machinery is not an affair of measurements only, not merely the determination of a maximum oxygen-supply. For if it were, competition would be a very dull proceeding, a mere question of preliminary calculation and decision by arbitration; and life would lose not a little of the spirit of adventure.

HOSPITAL COÖRDINATION AT CHESTER.—A consultative committee composed of representatives of the city council, Chester Royal Infirmary, Chester Maternity Hospital, and the Chester Division of the British Medical Association has been formed to consider the best means of coördinating the health work, municipal and voluntary, of the city.

MANCHESTER VICTORIA MEMORIAL JEWISH HOSPITAL.—It is proposed to extend this hospital at a cost of between £20,000 and £30,000. Adjoining land has been presented upon which a new block will be built to comprise a children's ward, complete medical and surgical units with an X ray wing. It is claimed that this wing will have better accommodation, in the way of treatment, examination, and dressing rooms than any other hospital in Manchester. There will be an increase of 20 beds or, if means permit of providing accommodation for paying patients, of 36 beds. The annual report shows that for the year ending June 30th, 1929, there was an excess of expenditure over income of £3347, which brings the total deficit to £7000.

TREATMENT OF LUPUS ERYTHEMATOSUS WITH BISMUTH.

By R. M. B. MACKENNA, M.A. Camb.,
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HON. DERMATOLOGIST, LIVERPOOL STANLEY HOSPITAL; HON. ASSISTANT DERMATOLOGIST, LIVERPOOL CANCER AND SKIN HOSPITAL.

Lupus erythematosus was probably first recognised as a definite clinical entity by Rayer[1] in 1827. Biette,[2] in 1828, gave a very graphic description of the general appearance of the disease. Hebra, in 1845, suggested the name "seborrhœa congestiva," and six years later Cazenave,[3] in a classical contribution to medical literature, gave the disease its present name. Since that date various eminent medical men, including Vidal, Feulard, Capelle, Leloir, Besnier, Brocq, Darier, Unna, and Leredde have studied the condition, and it is interesting to note, in view of recent contributions to the literature concerning this disease, that the majority of the early writers published their work in Parisian journals.

Since 1851 the term "lupus erythematosus" has signified an inflammatory disease which causes atrophy of the skin without ulceration. There are three definite clinical types of the chronic form of this disease: (*a*) In type 1 the lesions are slightly erythematous, and their surface is covered with fine scales. (*b*) Type 2 exhibits but a slight degree of erythema. Scaling is not a marked characteristic, but the orifices of the sebaceous and sweat glands are blocked with plugs of horny cells. The areas affected are more indurated and less pliable than those of the first variety. (*c*) In type 3 the lesions are vividly erythematous, and there is but little scaling. The incidence of the first two types of the disease is approximately equal. The third type of the disease is rarely seen, and in my experience is more commonly found in females than in males.

The cause of lupus erythematosus is unknown, but it is commonly presumed that the condition is a localised manifestation of a chronic toxæmia, the source of the toxins being the usual foci in the teeth, tonsils, nasal sinuses, and intestines. Some authorities still consider that the disease is a tuberculide. No theory of importance as to why there should be at least three chronic forms of the disease has yet been advanced.

In 1911 Sequeira[4] wrote:—

> "Very few skin affections are more difficult to treat than lupus erythematosus, and a favourable prognosis can never be given, even if the disease has only attacked a small area. All that can be promised the patient is that eventually, perhaps after years, there may be a gradual remission of the symptoms and scarring of the affected areas."

It is still advisable to give a guarded prognosis, but the outlook has been improved by the addition of two new remedies to our armamentarium during the last ten years. The first is injection of gold salts,—e.g., sanocrysin and krysolgan. Good results are claimed for the injection of these, but they are extremely toxic, and cannot be used as routine measures. The second is by the injection of bismuth or its salts.

History of Bismuth Treatment.

In January, 1929, three Frenchmen, Nicolas, Lacassagne, and Rousset[5] published the first detailed paper on the Treatment of Lupus Erythematosus by Injections of Bismuth Salts. They pointed out that there had been several isolated observations on the treatment of this disease with bismuth by Hudelo and Rabut,[6] Lortat-Jacob and Legrain.[7] The earliest of these observations was not published in November, 1926, but the investigators were not very satisfied with their results, as Lortat-Jacob reports:—

> "The experience which I have of bismuth treatment in the cure of lupus erythematosus shows that the cure is sometimes, but only in exceptional instances, obtained. Sometimes there is a transitory amelioration, but the majority of cases remain indifferent to anti-syphilitic treatment."

On June 9th, 1927, Sézary and Benoist[8] communicated two cases to the Société de Dermatologie, and shortly afterwards Nicolas and his colleagues commenced their investigations. In their paper published in January, 1929, they state:—

> "We estimate that the value of bismuth in this disease is greater than has yet been suggested. If all our patients have not attained a complete cure, the rapidity with which the signs have receded, the immediate effect on the subjective symptoms, and the state of the integument after a cure has been obtained, all militate in its favour."

Of 17 cases which they publish, all improved under treatment and ten were apparently cured. Hydroxide of bismuth was the preparation used in the majority of cases.

A Series of Twenty-four Cases.

During the last nine months I have treated 24 cases of chronic lupus erythematosus with bismuth injections. Metallic bismuth, bismuth oxychloride, and sodium-bismuth-thio-glycollate, have been used, the injections being given deep-subcutaneously or intramuscularly. Whenever possible the injections have been given once weekly or fortnightly, and in the majority of the cases after every 10 or 12 injections a period of some six weeks has been allowed to elapse before continuing bismuth treatment, so that there should be no risk of poisoning due to a cumulative effect. With regard to dosage, the average adult male or female can tolerate a dose of 0·3–0·4 g. of metallic bismuth or oxychloride of bismuth per injection, but 0·4 g. is the maximum which can be employed with safety. In the majority of the cases quoted below 0·4 g. of the metal or its salt has been given at each injection. I have found that metallic bismuth and bismuth oxychloride have approximately an equal therapeutic effect, whilst the thio-glycollate, which is a water-soluble bismuth salt, and therefore enables one to obtain a higher concentration of bismuth for a short period, has not, in my hands, given better results than the other preparations. I have tentatively tried giving bismuth oxycarbonate and bismuth salicylate in doses of grs. 5 to 10 thrice daily by the mouth, but without any apparent advantage to the patients. Inunction with colloidal bismuth preparations has not been tried, but local applications of "suspensol" (which is a colloidal preparation of metallic bismuth in an ointment basis) have not given satisfactory results. Two cases were given a 5 per cent. colloidal bismuth oxychloride ointment, and in one case (No. 12) there was a marked improvement.

Of a total of 24 cases treated since March, 1929, the following is a brief record of 14 of the most typical cases:—

Cases of Type 1.

Case 1.—Miss A., aged 28. First seen Feb. 18th, 1929. Four small areas of lupus erythematosus in scalp; three on forehead (two years' history). From May 14th to Nov. 30th a total of 5·6 g. metallic bismuth were given by injection. Considerable improvement occurred. Only two affected areas in scalp remain.

Case 2.—Miss G., aged 36. First seen May, 1928, when she stated that she had suffered from lupus erythematosus for 11 months. The nose was affected and there were symmetrical patches in front of the ears. From March 28th to Nov. 7th a total of 3·2 g. bismuth were given intramuscularly, the injections being given at irregular intervals. On Nov. 30th the patient was apparently cured.

Case 2.—Miss B. M., aged 18. Many small discoid areas of lupus erythematosus on scalp. A few on forehead. Lesions also on hands. From May 2nd to July 11th, 1929, a total of 0·8 g. metallic bismuth was given by injection. There was marked improvement, and from August 8th to Sept. 5th a total of 1 g. bismuth oxychloride was given. The lesions on the hands and forehead disappeared, but those on the scalp remained. From Sept. 17th to Oct. 17th 0·8 g. bismuth oxychloride was administered. On Oct. 30th one new area on the scalp was noticed. Two injections, each of 0·3 g. bismuth oxychloride, were given during November, but these had no apparent effect. Ung. bismuth oxychloride 5 per cent. was then prescribed. The patient has not returned for further treatment.

CASE 4.—Mrs. M., aged 38. *Lupus erythematosus of nose.* From August to November, 1929, a total of 4·8 g. bismuth oxychloride were given by injections. The lesions rapidly healed and there has been no recurrence.

CASE 5.—Miss B., aged 28. Nose affected and several areas on the cheeks. From August 2nd to Nov. 22nd a total of 2·7 g. bismuth oxychloride and 2·4 g. metallic bismuth were given. Considerable improvement has occurred, but none of the lesions have entirely disappeared.

Cases of Type 2.

CASE 6.—Mr. P., aged 39. First seen in July, 1929. Disease had been present for four years. On one occasion the lesions had been painted with acid nitrate of mercury, but for the preceding year nothing, except ung. acidi salicyl., had been used. The disease had steadily progressed, and in July, 1927, there was one large area on the left cheek and six small areas, each the size of a florin, affecting the left side of neck, nose, right cheek, and the left ear. From July 1st to August 8th a total of 2·6 g. metallic bismuth were administered. From August 21st to Sept. 13th 0·8 g. of thio-bismol was given, but there was no definite improvement. 1·4 g. metallic bismuth were administered during October, and the condition improved considerably. The patches are now healing at the periphery, but none of the original areas has completely disappeared.

CASE 7.—Mrs. O., aged 35. Oval patch of lupus erythematosus on nose, 2¼ in. in longest diameter. From July 10th to August 15th, a total of 0·6 g. metallic bismuth and 0·3 bismuth oxychloride was given. The lesions reacted rapidly to treatment, and by August 31st a cure had apparently been obtained.

CASE 8.—Miss H., aged 31. One discoid area of lupus erythematosus the size of a shilling on left cheek. One area the size of sixpence on forehead; 17 months' duration. From April 25th to Sept. 10th 1·8 g. metallic bismuth were given, and the patient was then discharged as cured.

CASE 9.—Mr. G., aged 38. Lupus erythematosus of two years' duration. Three discoid areas the size of a florin on left cheek. One area on neck below right ear. From July 16th to Nov. 30th 2·8 g. bismuth oxychloride were given. Lesions commenced to clear up rapidly.

CASE 10.—Mrs. F., aged 35. Lupus erythematosus. Three years' history. One discoid lesion on left cheek. From August 13th to August 26th 1 g. metallic bismuth and 0·2 g. thio-glycolate given. On August 17th carbon dioxide snow was applied. On Oct 15th she wrote "I am not cured."

CASE 11.—Miss G., aged 25. Very severe lupus erythematosus affecting the whole of both cheeks, the nose, and forehead, with a few discoid lesions in the scalp. From July, 1927, to April, 1929, she had received much local treatment with ultra-violet light. Salicin had been administered internally, and numerous external applications had been prescribed. From April 13th to Dec. 7th she received 4·8 g. bismuth and 1·5 g. bismuth oxychloride. Great improvement took place during October and November. Healthy skin is now visible in many areas on the cheek and forehead, and within the next six weeks she should be completely cured.

CASE 12.—Mr. H. L., aged 42. Two discoid lesions, the size of a florin, on each cheek, and one on left side of neck. From September to November, 1929, 4·8 g. bismuth were administered, and a great improvement was noticed.

Case of Type 3.

CASE 13.—Miss M., aged 34. Lupus erythematosus affecting eyelids and nose, extending downwards over the cheeks to a distance of one inch from the eyes. From July to October, 1929, a total of 4·8 g. metallic bismuth were given. No improvement. From November to December 1·6 g. oxychloride bismuth given. Some slight improvement then occurred, and the edges of the lesions began to clear up. No marked improvement was noticed until Dec. 4th. The patient was given 5 per cent. ung. bismuth oxychloride, and considerable improvement occurred during the ensuing 14 days.

CASE 14.—Miss C. M. J., aged 34. Lupus erythematosus of hands. Duration unknown. From April 10th to Dec. 7th a total of 1·4 g. metallic bismuth were given. Considerable improvement resulted.

With regard to local applications, in so far as was possible, the patients were kept on the same treatment as had been previously prescribed. The cases of types 1 and 3 usually used lotio calaminæ with 1 per cent. ichthyol, or Lassar's paste. The cases in group 2 usually applied 2 per cent. ung. acidi salicyl. Recently, local treatment with acid nitrate of mercury has been employed in a few cases, and recovery seems to be hastened by the adoption of this method in conjunction with bismuth therapy, although the amount of scarring is thereby increased.

Results.

To summarise these results. Of 14 cases of chronic lupus erythematosus—

5 cases, or approximately 36 per cent., were of type 1.
7 ,, ,, 50 ,, ,, 2.
1 case ,, 7 ,, was ,, 3.

In one case the hands alone were affected.

Two cases of type 1 and two cases of type 2 have been discharged as cured. Every case of the disease in groups 1 and 2 has improved to a greater or less extent, but the single case in group 3 only improved very slightly on bismuth injections. The time taken to establish a "cure," and the amount of bismuth which has to be administered, varies greatly with each individual. For example, Case 7 required only 0·6 g. bismuth and 0·3 g. bismuth oxychloride to obtain an apparent cure, whereas Case 12 was not cured after receiving 4·8 g. bismuth.

The one outstanding fact is that every case which has been treated with injections of bismuth, or bismuth salts, has improved, and has improved more rapidly than would have been anticipated had other remedies been employed. One other satisfactory finding has been that the lesions which respond to bismuth treatment heal with a minimum of scar formation, and in several cases, notably those belonging to type 2, healing has taken place without any residual scar being formed.

The mode of action of bismuth in lupus erythematosus is extremely hypothetical. The metal may act as a detoxicant, either in the tissues or when excreted into the large gut. It may perhaps act as a bactericide. If as a detoxicant it probably does not exert any influence when excreted into the bowel, for bismuth by the mouth has no marked therapeutic effect in these cases. More probably it acts by inhibiting the reaction of the tissues to the toxins (or bacteria) which cause the disease. Anwyl-Davies,[9] in a monograph on the use of bismuth in the treatment of syphilis, quotes the experiments of Kolle and Evers,[10] who injected a suspension of bismuth subcutaneously into the ears of rabbits, and four weeks later inoculated the animal with *Spirochæta pallida*:—

> "No primary lesion or generalised syphilitic infection occurred until the bismuth deposit was removed two or three months later by amputation of the ears. When this was done typical chancres developed, and the usual train of syphilitic signs ensued without a fresh spirochætal inoculation. Then they showed that in rabbits which had been inoculated with *S. pallida*, but in which no chancre had developed owing to the presence of the depôt of bismuth, the popliteal lymph glands contained *S. pallida*. Thus, this organism had not been prevented by the bismuth from travelling into the tissues. They made an emulsion from the popliteal lymphatic glands of rabbits in which the syphilitic infection had not developed owing to the presence of bismuth deposit, and demonstrated that other animals could be infected by inoculating them with this emulsion from an apparently immune rabbit (which had been inoculated with the lymphatic gland emulsion from another apparently immune rabbit which had not reacted to inoculation owing to the bismuth deposit).
>
> "Thus, the popliteal lymphatic glands of such apparently resistant rabbits are infectious, and it seems as though the bismuth in some way—possibly by some tissue reaction—merely *inhibits* the disease instead of having a direct curative action on the infection."

The tentative suggestion may therefore be made that any improvement occurring in a case of lupus erythematosus after the injection of bismuth or bismuth salts is due to the property which bismuth possesses in preventing the tissues from reacting normally to the toxins (or bacteria) which cause the symptoms of the disease. One would therefore expect that the persons who have been apparently cured will sooner or later exhibit a recurrence of the lesions. We may, however, claim that injection

Clinical and Laboratory Notes.

A CASE OF TYPHOID FEVER

WITH PERSISTENT NEGATIVE WIDAL REACTION BUT POSITIVE "O" AGGLUTINATION.

BY A. D. GARDNER, D.M.OXF., F.R.C.S.ENG.,
F. G. HOBSON, D.S.O., D.M.OXF., M.R.C.P.LOND.,
AND G. STENHOUSE, M.B., CH.B.MANCH.

THE notes of the following case, which has features of interest both for clinicians and pathologists, are published with the aim of calling attention to an important recent advance in laboratory methods, whereby cases of typhoid fever with persistent negative Widal reaction can be serologically diagnosed.

Clinical Description.

Miss A. B., aged 28, went to Italy for a holiday on August 14th, 1929. On Sept. 2nd, after bathing in a hot sun, she developed a headache and an acute attack of diarrhœa. Still suffering from headache, drowsiness, and increasing anorexia, she returned to England on Sept. 4th, and on the 13th had to take to her bed. She was first seen by one of us (G. S.) on the 14th. On the 19th, 17 days from the first sympton, a Widal reaction, done at the Royal Berkshire Hospital, Reading, was negative. She had never been inoculated against typhoid or paratyphoid fever. On the 25th a second Widal reaction, done at the Radcliffe Infirmary, Oxford, was negative. An examination of stools and urine was also negative for the typhoid group. A blood culture, however, yielded a bacillus, to be described below, which eventually proved to be *B. typhosus*.

The general clinical picture throughout the illness was of a severe typhoid fever, the first spots being detected on the abdomen in the third week. The spleen was never palpable, though splenic dullness was increased to percussion. During the fifth and sixth weeks there was a fairly severe hæmorrhage from the bowel. The sixth, seventh, and eighth weeks were complicated by a troublesome *B. coli* cystitis, and during the eighth and ninth weeks there was some periostitis of both femora. All complications were successfully overcome, and the patient made an uneventful convalescence. On Oct. 16th, 43 days after the first symptom, the serum still gave a negative Widal reaction to ordinary typhoid cultures. Two examinations of stools and urine for *B. typhosus* during convalescence were negative.

Bacteriological Notes.

The negative Widal test done on Sept. 25th at the Radcliffe Infirmary, Oxford (Dr. A. G. Gibson), with a standardised suspension of *B. typhosus*, was repeated and confirmed at the School of Pathology; and at the same time the serum was tested with two "O" suspensions of *B. typhosus*—viz., one made by treating with alcohol a smooth motile culture of *B. typhosus* 901; the other by adding 0·2 per cent. of formalin to a broth culture of the same strain in the non-motile "O" state. Granular agglutination occurred with both suspensions in four hours at 52° C., up to 1 in 125 (8 standard "O" units). This reaction was reported as positive though weak.

On the same day the Radcliffe Infirmary isolated from the patient's blood a non-motile non-lactose-fermenting bacillus of the typhoid coli group, which was not agglutinated by stock *B. typhosus* serum. Identification would therefore have been delayed had not an "O" agglutinating serum been available. With this, a full-titre "O" granular agglutination was obtained in a live saline suspension of the bacillus grown on an agar slope sown direct from the blood culture. The vast majority of the bacilli in the suspension were non-motile, but a very few swimmers were seen in the condensation water of the slope. Ordinary *B. typhosus* serum gave no flocculation (H) with this suspension, but slowly produced "O" granulation to a relatively low titre. Fermentation tests gave, on the following day, the picture of *B. typhosus*, and the bacilli in the various fluids were found to have acquired motility and agglutinability by ordinary typhoid (H) serum. The bacillus was clearly in the "O" state in the blood culture and first subculture, but rapidly changed to "H."

Further tests with the patient's serum gave granular agglutination (*a*) to 1 in 250 with a formolised broth suspension ("standard culture") of *B. enterit. Gärtner*; (*b*) to 1 in 500 with living saline suspensions of *B. typhosus* 901 H and O; (*c*) to 1 in 1000 with patient's own bacillus. Here the clumping was exceptionally fine; indeed hardly visible with the naked eye.

A repetition of the agglutination tests with a fresh sample of serum 20 days later gave: (*a*) again no H agglutination; (*b*) granular agglutination to 1 in 50 with formolised broth "O" suspension (6 standard "O" units); (*c*) granulation to 1 in 125 with living saline "H" 901; (*d*) feeble and unsatisfactory granulation to 1 in 125 with living saline "O" 901. It may be mentioned that the greater agglutinability of living suspensions is of doubtful value, since it raises the level of agglutination in normal serum as much as it increases the apparent titre of specific serum.

Commentary.

This case is far from standing alone. A considerable number of similar cases have been recorded by Burnet, Felix, and others.[1] We have heard very recently of another in this country, and a third came into the hands of one of us just before these notes were sent to press. [Negative H, positive O agglutination; non-motile "O" *B. typhosus* in blood.] In fact they are probably a good deal commoner than we have hitherto supposed. The value of the "O" test is, moreover, not confined to such cases as these or to cases in which O agglutination appears earlier than H; but it seems to be particularly great in the diagnosis of typhoid fever in inoculated persons with residual "H" agglutinins.

Since typhoid cases with negative "H" but positive "O" agglutination occur from time to time, clinicians should require, and pathologists perform, the Widal test with "O" suspensions in addition to the customary "H." Agglutinating serum of the "O" type should also be at hand for the identification of the so-called inagglutinable typhoid bacilli. The persistent low titre of the "O" agglutinins in this case is of interest.

BRONCHIECTASIS: FORME HÉMOPTOÏQUE SÈCHE.

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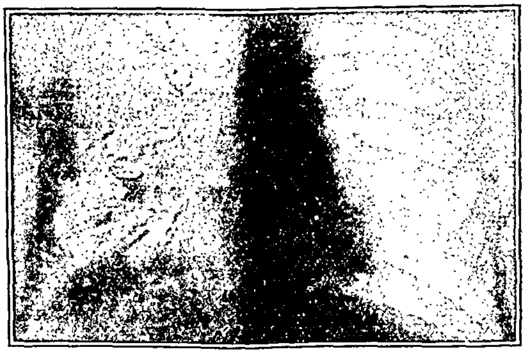
THIS form of bronchiectasis is characterised by periodic attacks of hæmoptysis but absence of symptoms between the attacks. Since the introduction of lipiodol, bronchiectasis may be diagnosed in cases where otherwise it would have been completely unsuspected. Such cases are by no means uncommon and the following may be taken as a typical example.



Bronchiectasis shown by an injection of lipiodol.

A young man, aged 23, had always had good health and led a normal athletic life. He had just passed through a theological college, and was considered to be quite fit, when suddenly in August he had a large hæmoptysis of over a pint. There were no physical signs and he felt perfectly well afterwards, but he was sent to Midhurst Sanatorium. *Occasionally a few moist sounds were heard at the base of* the right lung, but these were not always present, and X ray examination showed no definite disease in the lungs. There was no cough or sputum and he suffered from no dyspnœa or fatigue. The fingers were not clubbed. On injecting lipiodol, however, a considerable degree of bronchiectasis was shown, as can be seen in the accompanying skiagram which was taken by Dr. Stanley Melville.

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[1] See A System of Bacteriology, Medical Research Council, 1929, vol. iv.

In the absence of any symptoms no definite treatment was advocated, and the patient's health has so far remained good.

A NOTE ON THE USE OF AN

ORGANIC SULPHUR COMPOUND IN COCCAL INFECTIONS.

By Dr. Elie Sassoon
(ALEXANDRIA).

The following notes are taken from a record of cases of pneumococcal, streptococcal, and staphylococcal infections, treated during eight years' service in the Sudan as medical officer, with a new sulphur organic compound to which I have given the name of "sulphoserum."

Preparation of the Serum.—To 20 c.cm. of sterile normal horse serum is added 0·4 c.cm. of 2 per cent. sol. calc. sulphurat., the mixture hermetically sealed in ampoules, *and kept in an ice-chest. A reaction takes place within the* ampoules, by which the calcium sulphide is decomposed into precipitated lime, with liberation of SH_2—part of which is dissolved in the serum.

Method of Administration.—Sulphoserum may be given in two different ways: (1) By local application. The region selected is cleansed, the skin is scarified, and a pad of cotton-wool soaked with the serum is applied. The SH_2 absorbed produces a tingling sensation radiating from the point of application; when it causes vertigo the application is stopped. A slight rise of temperature with discomfort and headache sometimes occurs a few hours later. The application may also be made to wounds. Some cases are more sensitive than others; the treatment in any case is adapted to the extent of the scarified surface, and the quantity and time of sulphoserum applied.

(2) The intravenous method is used when the patient does not react to local application. The initial dose is 0·25 c.cm. *daily, increased if necessary. The injection should be given* very slowly.

Sulphoserum was found to be of value in all pneumococcal, staphylococcal, and streptococcal infections. If given in the early stage of lobar pneumonia the pain ceases and fever drops to normal on the second or third day. Given early in acute inflammations, such as cellulitis or sympathetic ophthalmia, pain and redness subside, and the temperature falls. I have also used the serum to prevent secondary infection after surgical operations.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF GYNÆCOLOGY AND OBSTETRICS.

At a meeting of this Section on Jan. 17th, with Dr. Arthur Giles, the President, in the chair, Dame Louise McIlroy described

Three Cases of Imperforate Vagina Occurring in One Family.

The first patient was a girl, aged 20, who had never menstruated, but who, for some time, had been complaining of monthly pain, and of swelling of the abdomen. On examination she was found to have an abdominal swelling extending to two inches above the pelvis, non-fluctuant, and rounded. Per vaginam, a bulging membrane was seen in place of the vaginal orifice. On operation a large quantity of menstrual material was released; the patient made a good recovery and afterwards menstruated normally. Subsequently a sister, aged 16, was seen, giving almost the same history, but in this case occasional vomiting had occurred. The abdominal swelling reached the umbilicus, and a smaller rounded swelling, clearly the uterus, could be felt at its apex. Operation again gave excellent results, the amount of fluid being "extremely large." On inquiry, a third sister, aged 14, was presented for examination, who also showed this condition, but without bulging of the membrane, and apparently without abdominal swelling. Operation, however, released two pints of menstrual fluid, and resulted in subsequent normal periods. Sections of the membranes by Prof. Geoffrey Hadfield showed a connective tissue stroma with blood-vessels and smooth muscle-fibres, and an outer layer of squamous epithelium.

Prof. J. Preston Maxwell said he had met this condition not infrequently in China, and that imperforate vagina could be diagnosed from imperforate hymen by the presence of the hymen as a small fold on the surface of the bulging membrane. He thought the cases described by Dame Louise were more likely to be imperforate hymen.—Mr. L. C. Rivett said that the interest of these cases lay in the fact that they had all occurred in one family. There had been no previous evidence of a familial tendency in this condition.—The Chairman described the difficulty of dealing with cases in which the vagina was represented by an uncanalised column of cells. On one of his patients, a girl of 16, he had had to perform an abdominal operation to establish a patent vagina.

Dame Louise McIlroy, in replying, asked what her cases should properly be called—imperforate vagina or imperforate hymen?—The Chairman replied that, as there appeared to be no traces of hymen visible on the face of the membrane, these were probably cases of imperforate hymen.

Mr. J. H. Hannan gave the results of investigations on the detection of

Anterior Lobe Hormone of the Pituitary in the Urine.

In 1922, he said, it had been demonstrated that the anterior lobe of the pituitary produced precocious sexual maturity in immature female mice, denoted by canalisation of the vagina, the appearance of œstrus as judged by the vaginal smear, and the presence of corpora hæmorrhagica in the ovaries. In 1928 Zondek and Aschheim had used the presence of anterior lobe hormone in the urine of pregnant women as a test for pregnancy. Their technique had been to use five mice weighing 6 g. each in every case. 1·2–2·4 c.cm. of urine had been injected into these animals in six portions, over a period of 48 hours. At the end of 52 hours the animals were killed and examined for signs of œstrus, for hæmorrhagic points in the ovaries, and for the formation of corpora lutea atretica in the ovaries as seen microscopically. Positive results in only one of the five was taken as evidence of pregnancy in the patient. These workers claimed 98 per cent. of accurate positive, and 99 per cent. of accurate negative results. Owing to the difficulties of obtaining enough mice, and the high mortality among them from toxicity of urine, Mr. Hannan had employed young rats, aged 6–8 weeks, in his experiments, only one animal being used for each case; 3 c.cm. of urine was given, all in one injection, and the rat was killed after 96 hours. All his patients had been cases of amenorrhœa from various causes, except for 15 normal non-pregnant women taken as controls. His results could be tabulated as follows:—

—	Cases.	Wrong.	Percentage error.
Pregnant women	41	3	7·3
Non-pregnant women ..	15	0	0
Diseased women, with amenorrhœa	43	12	27·9

He found that the reaction rapidly disappeared after delivery. In addition he had collected and analysed 913 cases from the literature with the following results:—

—	Cases.	Wrong.	Percentage error.
Pregnant women	452	8	1·8
Non-pregnant women ..	461	15	3·2

His own results differed from those of previous workers in having a higher percentage error among pregnant and diseased women, though he showed an absence of error among non-pregnant women. His error in the former cases could probably have been reduced by microscopic examination of the ovaries. Also the use of younger rats might give more trustworthy results. The test was positive only when fœtal elements were present in the patient. Some observers had found positive results in the case of hydatidiform mole, but he had not done so. In his opinion the test depended upon too many variable factors to be reliable; and if not reliable, it was of no great value.

Dr. **Veisner** (Vienna) said that during the last two years in Edinburgh he had helped to establish a pregnancy diagnosis centre based on this test. He did not consider it advisable to reduce the number of animals or to use rats. The anterior lobe of the pituitary produced four hormones, and during pregnancy two of these were also formed by the placenta and appeared in the urine. The test was, therefore, a placental sign. In cases where the production of hormone was too small to give a positive result the pregnancy usually ended in abortion. In their series the percentage error had been 3·02. Some of the negative cases had aborted, as might be theoretically expected.

Dr. E. M. **Robertson** said that at the Edinburgh centre, of the 400 cases confirmed by the doctors who sent up the specimens, the 3 per cent. of erroneous results could be analysed as follows:—

	Cases.
Unexplained by doctor	5
Evidence of dead fœtus	5
Endocrine disturbance. (Negative result, pregnant patient)	1
Two tests: first, positive; second, negative. (Possibly aborted during interval)	1
Hydatid, positive	4
Ectopic, positive	3
Tubal mole, negative. No villi seen microscopically	2

In two cases of chorion epithelioma positive results had been obtained, and also in one case of previous abortion, where curetting showed scanty fragments of villi still present.

Mr. F. **Dickens** said that among 250 cases of pregnant and non-pregnant women tested at the Middlesex Hospital he had found a 2 per cent. error among the pregnant and a 3 per cent. error among the non-pregnant cases.[1] The test had remained just positive as long as 24 hours after delivery. The larger error found by Dr. Hannan was probably due to the use of rats, in which animals spontaneous luteinisation was known to occur.

Dr. O. B. **Voge** mentioned the possibility of some chemical test being evolved, which would also throw light on the nature of the Zondek-Aschheim test. Working with bromine water on the lines of the histidine test, he had obtained 86 per cent. of results in agreement with the Zondek-Aschheim test, and on the same cases. If a number of cases of old urines were excluded, his results reached 91 per cent. of agreement.

Mr. H. **Burt-White** said that he had obtained 9 per cent. of errors in using the chemical test. He had found five out of six positive results in cases of exophthalmic goitre; diabetes mellitus, hæmophilia, and several cases of malignant disease had given positive results.

Mr. **Rivett** said that the test was of no value if the percentage error could not be reduced below Dr. Hannan's figure, for only one case in a hundred presented any difficulty in the clinical diagnosis of pregnancy.

The **Chairman**, in calling upon Dr. Hannan to reply, said that the test depended on the chorionic elements of the placenta; it was interesting that chorion epithelioma gave positive results. Chemical tests, if they could be made sufficiently accurate, would be extremely valuable.

Dr. **Hannan** agreed that the percentage error was too high, but repeated that his cases had been women with amenorrhœa; his findings in exophthalmic goitre had confirmed the chemical tests on the same cases. He doubted whether the error could be reduced below 10 per cent. while the test involved so many variable factors.

Prof. **Preston Maxwell** read a paper entitled

Further Studies on Osteomalacia.

In diagnosing osteomalacia, he said, deformity should not be remembered as the cardinal sign. There were other and much earlier signs and symptoms which were sufficient to establish a diagnosis, among which were pain in the back and thighs, spasm of the adductors, tenderness and softening of the bones, and muscle irritability. The disease was due to deficiency of vitamin D; or at least this was the case in China, in his opinion. It was observed that large numbers of girls were being brought into the province of Shansi during recent years, and in this province osteomalacia was particularly rife since the famine of 1875. It was probable that these girls were required to supply the places of those who died in childbirth as a result of the disease. In the late stages the deformities became marked, and the patient was liable to die of intercurrent disorders. In the early cases the gait was characteristic, with slight bending of the knees and adductor spasm. Scoliosis and kypho-scoliosis developed as the disease advanced, and a transverse sulcus appeared above the pelvis at the back. Radiography showed the characteristic tri-radiate pelvis, with the ischial tuberosities close together, sometimes associated with multiple fractures, and sometimes with marked bending of the long bones. The reason why fractures occurred in some cases and not in others was not understood; it possibly had something to do with the relation between blood phosphorus and blood calcium. The blood calcium was always low in these cases, but the diffusible calcium varied in its behaviour. In the chest the deformities were usually those associated with kypho-scoliosis; the pelvis showed rarefaction of the bones and rostration of the symphysis, with approximation of the ischial tuberosities. The sacrum became markedly convex, and the tip of the coccyx might approach so close to the ischial tuberosities that between them they obstructed the entrance to the vagina. The long bones showed bending and fracture, and the ribs on palpation revealed soft spots into which the finger sank. In pregnant women the fœtus was also affected; the cord blood calcium at birth might be down to 8 mg. per 100 c.cm. There was a tendency to antenatal rickets, and often the child developed rickets at the same time as the mother developed osteomalacia during lactation. The fœtus often showed marked irritability in utero. The food of these women consisted of corn bread, cabbage soup, rice, and vegetables; all cooking was performed with vegetable oils, and the diet contained no animal fat, meat, or eggs. The women lived indoors and took no exercise. When treated with fresh air, sunlight, cod-liver oil, and irradiated ergosterol, they usually improved enormously, mentally as well as physically. Spasm and pain of the muscles were definite symptoms of the disease, but the speaker was not satisfied that the tetany was a part of the disease at all. He thought that many mild cases of the condition passed undetected, even in this country, and that "funnel pelvis" was often a result of mild osteomalacia. Many cases of pain in the back during pregnancy improved on open-air treatment, full diet, and cod-liver oil. Osteomalacia of a marked degree could be cured by similar treatment, and irradiated ergosterol had proved of great value in this connexion; if cod-liver oil was given alone the doses must be very large—over ℥ii a day—but if ergosterol was given as well the dose could be much reduced. There was no excuse for oöphorectomy in these cases, and no evidence that it effected a cure. Operations for obstructed vagina by removal of part of the encroaching bones on one side were often very successful, and led to the renewal of marital relations and pregnancy, with subsequent delivery by Cæsarean section.

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[1] See THE LANCET, Jan. 4th, p. 39.

Mr. RIVETT said that the treatment of osteomalacia opened a new field of activity for the workers in artificial sunlight and radium therapy, and fresh opportunities for investigation by the biochemists.—Dr. VEISNER said the condition might depend on two factors: lack of vitamin D, and lack of coördination in the endocrine apparatus to supply the conditions for its use. Probably both factors were involved.

Prof. EDWARD MELLANBY said that he was much interested by the evidence of fœtal rickets demonstrated by the radiograms of Prof. Maxwell. He had tried to produce this condition, using pregnant bitches, but without success, since by the time the calcium deficiency was marked enough for the purposes of the experiment the animals died. The results of absence of vitamin D from the diet were aggravated, in his opinion, by the high proportion of cereals taken. Cereals actually increased decalcification, as could be shown by giving oatmeal in rickets, to take an example. Tetany apparently bore no relation to total calcium or total phosphorus, but to some physical condition of the calcium.

Dr. HARRIETTE CHICK said there had been much osteomalacia of a minor degree in Vienna immediately after the late war. It was largely a disease of winter and occurred among the poorest classes; deformities were most marked in the convents, where fat was rare. Cod-liver oil had proved invaluable. Cases had been found among men as well as women. Possibly in China men were also affected in minor degree.

Dr. G. W. THEOBALD said that the disease did not occur in Malaya, Southern India, or Siam, but that cases were found in Northern India among the women who kept strict purdah and seldom saw the sun.

The CHAIRMAN said he was glad to hear Prof. Maxwell denounce oöphorectomy in these cases. The demonstration of the curability of the disease had been striking, but he would be interested to know whether it were not liable to recur on return to faulty conditions.

In replying, Prof. MAXWELL said that the only possible reason for removing the ovaries was that the operation stopped menstruation and pregnancy, and saved a little calcium by these means. It was an inexcusable form of treatment. Many men showed the disease in China. The condition recurred if the patient returned to unsuitable diet and surroundings, but the aim was to train them to avoid this while they were in hospital.

SECTION OF ELECTRO-THERAPEUTICS.

AT a meeting of this Section on Jan. 17th, with Dr. C. A. ROBINSON, the President, in the chair, a paper on

CUTTING CURRENTS

was read by Mr. JOHN ANDERSON (Dundee). These currents, he said, had not received the same attention in this country as in America. But he was sure that surgical diathermy had a wider application in treatment than was at present realised here. It was now 16 years since he had started a clinical investigation on the uses of the cutting current in the ordinary work of the general surgeon. His small Schall apparatus had proved until recently to be the most efficient cutting instrument he had ever tried; he had since tested ten other instruments which were reputed to cut well, but he had been continually disappointed in them. The Cushing-Bovie machine, however, which he had just begun to employ, had a wider range than any other, and he had reason to believe that healing would be equally good with it. Since 1923 he had used diathermy in 98 cases of radical removal of breast cancer, and primary union had been the rule; in only a small number was there delay in healing, or any difficulty in that respect. The group of cases so dealt with also had a shorter stay in hospital than those operated upon with the knife. When there had been some delay in union, it could usually be attributed to some technical inefficiency in the instrument, causing more coagulation and less cutting effect than was desirable, dehydration being consequently excessive. Electrical experts still differed about the exact nature of the various currents produced by the Schall machines. The frequency of the small Schall, as tested with the wireless, was probably over a million, and the waves were practically undamped in character. With the Cushing-Bovie machine the depth of dehydration could only be regulated by using different electrodes or by contact currents. The heavier the electrode the deeper the dehydration, and the more rapidly the active electrode was acting the lighter the dehydration. With this instrument it would now be possible to regulate accurately the amount of dehydration and the rapidity of cutting in the different tissues.

Mr. Anderson said he used the cutting current for all biopsies because he believed it eliminated the risk of spreading cancer cells. Even in cases in which radium was to be used he felt that one could complete the academic picture without increasing the risk to the patient. When the tumour was large he used circumvallation and then excision by the cutting current. When it was small, circumvallation was liable to interfere with the histological appearance of the section.

Results in Malignant Disease.

As regards results in his series of cases, he said he realised that no results of value could be given until at least eight years had elapsed; but up to the present only two of the 98 cases had shown local recurrence apart from a general carcinomatosis; there had been no case of secondary hæmorrhage, nor any instance of marked protein shock. Conversely, there had been much less post-operative pain and shock than with other methods. He thought the absence of post-operative pain after diathermy excision was due to "capping" of nerves after their section. In one case he did a radical excision of the breast at 4 P.M., and at 8 P.M. the patient was listening-in to the wireless. In inoperable cancer he used the coagulating rather than the cutting current. He employed the method for all tumours of the bladder, and cystoscopic control had proved that after its use the healing in this area was especially good. One could frequently see the operation wound when the knife had been used, but the diathermy excision wound often was not discernible. To bring about dilatation of the bladder it was important, in his opinion, to use air rather than water. After opening the abdominal wall one could then see exactly what one was doing, aided by the guidance of the finger. In prostatectomy, by the open operation according to Sir John Thomson-Walker, he had found the diathermy current a great advantage, as compared with suture or ligature, to produce hæmostasis. He had clamped vessels with forceps and simply applied the electrode to the forceps to bring about the local coagulation. He used diathermy for titivating the prostatic bed after ordinary prostatectomy, and he used it also for partial prostatectomy, and even for complete prostatectomy when the gland was small and hard. Further, he used it to make room for the insertion of radium in cases of malignant disease of the prostate; and in none of these prostatic cases had there been any alarming secondary hæmorrhage. For cancer of the tongue he had been employing both the coagulating and the cutting current. In the tongue cases a primary laryngotomy and packing of the nasopharynx were carried out before the tongue excision was done; this not only gave the anæsthetist a chance, but also prevented the aspiration of matter into the thorax. In a general way he was able to declare that this method had rendered the risk attendant on operative procedure almost negligible. Most of the patients were able to get up on the second or third day, and left the hospital within ten days. A number of tongue cases were thus dealt with which formerly were pronounced inoperable and were not touched. Diathermy was used, too, for skin, lip, and mouth tumours, hæmorrhoids, and tumours of the vulva, but he had not yet tried it for brain and abdominal tumours.

The method was criticised, said Mr. Anderson, because it was not bloodless. It was not intended to be so; but it reduced the loss of blood by half. Operation was bloodless when the coagulating current was used, but in that case it was unreasonable to expect primary healing. Two types of operation had, therefore, to be considered. When one was cutting through relatively safe tissue and attempting to prevent the manipulative spread of the cancer cell, the arc electrode with its 0·1 mm. dehydration was sufficient to prevent dissemination, for it sealed all lymphatic vessels and at the same time prevented capillary bleeding. A considerable number of cases had been reported in which healing was bad and some sloughing of the wound took place. He was familiar with those cases; they had been associated with a machine which was not working properly or with faulty technique; in other words, coagulation was too deep, and the dead tissue left was in too large quantity for the natural process of repair to overcome.

Future of the Method

It was interesting to inquire why the method was not more used. In this country there was considerable uncertainty about the exact nature of the currents, their effect on tissues, and the varieties of current produced by different machines. Satisfactory liaison was lacking between the electro-therapeutist, the surgeon, and the electrical expert who designed or built the machines. Some of his colleagues wished to establish the method in their clinics, but found a difficulty in procuring an efficient machine which would yield a uniform output. Until recently, with an alternating current he had not been able to get an efficient cutting effect. Until machines were properly standardised, diathermy for surgical purposes would not take the place in this country which it ought to have. The surgeon was not willing to hand over his material to the electro-therapeutist—for what he often considered might be experimental purposes—with the result that he might be using a machine which did not carry out the best work. In Europe very few machines had been produced which gave a first-class cutting current under control. He himself had enjoyed the close coöperation of Mr. G. H. S. Milne, and he thought that it was essential to work with a technician in this way. It might be possible to answer such questions as: What is a spark? What is its effect on tissue? Does it affect by electrical means the staining agents? What is the effect of the electrical current on the local anæsthetic which is impregnating the wound? He had been much disappointed with local anæsthesia in association with the use of the cutting current. Some patients complained of pain in such circumstances, and then resort to the knife eased the pain. In examining histological changes in the cells after the use of the diathermy current he would prefer to make a series of sections by immediate freezing, instead of by the prolonged hardening method.

The Cushing-Bovie machine, which Mr. Anderson demonstrated, seemed, he said, to be a long way ahead of any other he had tried. The amount of dehydration seemed to depend almost entirely on the nature of the damping of the wave; a purely undamped wave seemed to give almost the same effect as a scalpel. He had never used more than half of the possible power of this machine, and that was for sealing vessels. Most of the surgical work was done with 35 per cent. of the total power. Cartilage could be cut well with a high voltage. He had been able to cut out a shelf of an ox's femur with a simple wire snare, as if it had been cheese. For dealing with fat, a heavy dehydration was best. In conclusion, Mr. Anderson said that surgical diathermy would do all that the scalpel could do in the treatment of malignant disease, and had certain advantages over the scalpel. What was needed was a standard portable relatively cheap and relatively fool-proof apparatus. The present machine was not portable nor cheap, but the method was absolutely safe.

Discussion.

Mr. E. P. Cumberbatch said it was one of the functions of medical officers in charge of electro-therapeutical departments not only to administer electricity to such cases as were sent to them by the staff, but also to keep them in touch with new electrical methods. He had first seen this cutting method in the clinic of Howard Kelly, of Baltimore, and then he learned that the same means was being used by Mr. Gordon Taylor at the Middlesex Hospital. Afterwards he got to know that the latter learned the method from Mr. Anderson, of Dundee. He, Dr. Cumberbatch, implored every candid man who desired help for himself or his neighbour to make a thorough investigation of this method. At present the majority of surgeons in London were using radium in treating malignant disease, but surely there was a place here for the cutting current.

Dr. G. B. Batten urged that such team-work as had been mentioned should commence immediately; wireless was a good example of a demand producing in a very short time such investigation as had resulted in a great accession of knowledge.

Mr. H. P. Gough said he hoped to profit by Mr. Anderson's lecture in the designing of future apparatus. On behalf of Messrs. Watson and Sons he offered the best possible coöperation towards the attainment of perfection of apparatus.

Dr. J. B. Cook suggested that the apparatus had other uses in the profession than in operating for malignant disease. He asked whether it could not be used for operations on bone, as in removing portions in osteomyelitis. Perhaps it could be used for mastoid operations also, in which hæmorrhage was often a trouble.

Dr. C. G. Teale pointed out that in using the Schall machine it was important to keep the electrode in motion, otherwise a slough formed, and that interfered with rapid healing. At the hospital he was connected with, a surgeon who had been working with Dr. Harvey Cushing in America was anxious to use the method for dealing with cerebral tumours, but in preliminary experiments he found it difficult to keep the electrode moving quickly enough for this cerebral work.

Prof. Geoffrey Hadfield said he was a member of a team of the kind which the opener and several other speakers referred to, and that team had been carrying out a research, chiefly on animals, because working on dead meat did not afford information as to what happened in the tissues. What was needed now was a widespread propaganda among surgeons, who should learn what the method could accomplish; this would obviate poor results from coagulating currents, which inevitably delayed healing. The result so far was a bias in favour of the diathermy knife in comparison with the ordinary knife in the matter of recurrences after operation.

Mr. E. W. Riches, speaking as a former house surgeon to Mr. Gordon Taylor, said the sealing of the vessels by this method obviated the need for applying numerous ligatures. There was a danger that cartilage would necrose if touched with the diathermy knife.

Mr. Anderson, in reply, said he had only known this Cushing-Bovie machine for ten days. With the Schall apparatus it was necessary that the knife be kept moving, preferably with a movement as if making a rapid sketch. As soon as movement was slowed or stopped a coagulating effect occurred. With the Schall machine a pure cutting current was not used.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

A MEETING of this Society was held on Jan. 16th, the chair being taken by Dr. G. CARMICHAEL LOW, the President. Prof. MAX H. KUCZYNSKI (Berlin) read a paper by himself and Dr. BIANCA HOHENADEL on the

ÆTIOLOGY OF YELLOW FEVER,

with special reference to the problem of insect-borne disease. An abstract of this appears on p. 180.

The PRESIDENT sketched the chequered history of research into the ætiology of the yellow fever organism, and emphasised the caution which must be observed before coming to a conclusion.

Dr. J. A. ARKWRIGHT wished to know further details about the bacillus; how it was possible to distinguish it in culture from other diphtheroid bacilli, and whether it had an exotoxin which could be separated by filtration. He also inquired the criterion by which Prof. Kuczynski decided the presence of yellow fever in an animal, and suggested that Prof. Kuczynski's method was somewhat unnecessarily complicated. He understood that in typhus cultures which began as cocci changed to something which, if it was not exactly proteus X. 19, resembled it. This meant that bacteriologists were called upon to accept an entirely new idea, and one that required searching criticism. At the same time, proteus and rickettsia both had a fundamental relationship to typhus fever; the change must take place somewhere, and it was perhaps begging the question to criticise the change which was alleged to occur in vitro. It was necessary, however, to take care that one's faith in the unity of the two types of organism did not carry one away into accepting these extraordinary changes without question.

A Secondary Organism?

Prof. E. HINDLE proposed to criticise not the facts related by Prof. Kuczynski, but his interpretation of them. In the first place, it was true that in the normal course of events an animal infected with yellow fever had a fairly regular temperature chart. As a rule the temperature went down quickly, but by no means always; exceptional cases were constantly being reported of long incubation periods and long atypical fevers, with animals succumbing up to 23 days. From these atypical infections it was possible to recover typical infections, but as these atypical courses were usually reported in man, the results in animals should not be accentuated too much. The ordinary infection with a rise of temperature on the second or third day, and then two days afterwards a sudden drop and death, was strikingly different from the infection in which the rise lasted for seven or eight weeks. He himself, however, had seen incubation periods as long as 12 days, and the temperature charts should therefore not be regarded as indicating any important difference between infections with virus and infections with the bacillus. Assuming that an injection from a culture might contain a very dilute or attenuated virus, a fever or infection of this type might reasonably be expected.

A fact which might explain many of these results was that, in yellow fever, particularly, destruction of the liver was one of the important features of the disease. Work on ketosis had shown that when the liver was infected the animal became especially liable to infection with secondary organisms. Various species were particularly liable to various kinds of secondary organisms, and it was conceivable that a monkey infected with yellow fever might be infected fairly constantly by the same secondary organism. Secondary diphtheroid infection might therefore occur with a certain amount of regularity, although its connexion with the disease was only accidental. Mr. Hindle had been carrying out experiments to determine whether it was possible for the virus to be associated with bacilli; he thought there were some grounds for believing that it could. On broth and agar, both aerobically and anaerobically, the organism departed from the small form and became somewhat larger, more closely resembling Hoffmann's bacillus. If the bacillus were mixed with the virus by soaking in it for a day or two and then washing, virus would be absorbed. The bacillus itself would then produce no infection, but the washed bacillus would. Prof. Kuczynski, he supposed, injected an amount of virus approximately equivalent to 1,000,000 lethal doses, corresponding to a gramme of tissue or a cubic centimetre of blood. If subcultures were made, presumably a dilution was taking place from tube to tube, and by the sixth or seventh subculture there was practically no chance of any virus remaining. Assuming, however, that all the virus was concentrated in the bacilli, so far from diluting ten times when making a subculture, the amount of virus might be only halved, or reduced by even less. This would explain the achievement of positive results with subcultures up to the thirteenth or fourteenth passage.

It might be objected that the virus could not live so long. Actually, however, it would live in glycerin for months. The known properties of the yellow fever virus were very peculiar ones for a bacillus. On the one side was extraordinary resistance, and on the other fragility. It resisted glycerin and cytolytic agents, though it formed no spores. On the other hand, it was very susceptible to acidity, and died when the pH was lowered to about 4. All this evidence suggested that yellow fever was caused by a virus rather than by a bacillus of the kind suggested, which, if it resembled the diphtheroids, might be expected to resemble them in its physical properties.

With regard to sublethal doses: when the minimum lethal dose was approached, certain animals seemed to show infections without any obvious signs of disease. Mr. Hindle did not see why these infections by the bacilli should be of any particular consequence. It was not necessary to assume a bacillus different from the virus. The infection of an animal with monocytes from a recovered patient brought yellow fever into line with other virus diseases, and was an extremely important and interesting piece of work. So far, however, from providing evidence in favour of a bacterial causation, it favoured the virus theory. He supposed that the monocyte was the refuge of the residual virus which was so common in animals and patients who had recovered from yellow fever, and that the washing had simply removed the bodies which had prevented the latent infection from being shown in the previous experiments.

Further Criticism.

Prof. J. C. LEDINGHAM did not think that Prof. Kuczynski's evidence was at all convincing. He asked for definite information on whether the organism was capable of infecting a susceptible animal. He had gathered that the virulence of the organism was highly capricious. If that were so, he inquired whether there were any serological connexion between the organism and the human serum and that of recovered or immunised monkeys. Diphtheroids were rare organisms, but had given an enormous amount of trouble through the fact that they were found in the cultures after prolonged incubation. It was important that no causal significance should be attributed to these organisms without strict proof. It was, however, true that some of the diphtheroids were capable of infecting guinea-pigs and might produce the lesions described. The suggestion of an ultramicroscopic virus developing on cultivation into an ordinary micro-organism was novel. To take one example, the pleuro-pneumonia organism of cattle could be cultivated in tissue and was capable of developing colonies in artificial media, but it did not grow bigger or become microscopically visible.

Dr. G. W. M. FINDLAY mentioned one virus disease which was capable of being associated with secondary bacteriological infection. This was the virus myxomatosus in rabbits. He asked whether cultures had been taken from normal monkeys to see whether any diphtheroid organisms could be grown from them, and whether any controls were made on the rabbit's heart and kidneys to see whether they were inoculative to diphtheroids. Some viruses, he said, could survive a considerable time at 37° C., particularly the agent of the Rous sarcoma, which sometimes survived for a week in partially aseptic cultures similar to those used by Prof. Kuczynski. If a serum immune against a virus were mixed with the virus and the mixture inoculated, no infection followed. He asked whether this had been tried with the yellow fever organism.

Dr. **Harold Scott** gave an account of a paper by a Portuguese research worker on this subject, who had isolated from two human cases no less than 27 different organisms which he had enumerated under various index numbers. In particular this worker had found that the serum of recovered cases agglutinated a particular organism to a titre of 1 in 60. The speaker asked whether any cultivation experiments had been done with the serum of recovered cases by Prof. Kuczynski, and whether he had tested the Costa Cruz reaction for reduction of complement, which seemed to be absolutely certain in yellow fever. The organism, he thought, might be analogous to proteus X. 9 in typhus, or pneumosintes in influenza. These organisms had to be regarded with extreme caution. It must be clearly established that the bacillus was neither a concomitant nor a contamination, and that it was ætiologically connected with the disease.

Dr. C. **Fletcher** said that Prof. Kuczynski had not mentioned whether any rhesus monkeys which had recovered from the infections produced by the bacillary strains had been tested for immunity with inoculations of the virus. The importance of this work seemed to go much further than yellow fever. If it was correct, Koch's postulates went by the board, and old-fashioned bacteriologists received a profound shock. The whole question should be investigated further forthwith.

Dr. C. C. **Okell** remarked that, when working with Mr. Hindle, he had cultured the liver from a great many monkeys. He had, it was true, sometimes grown as many organisms as Dr. Scott's Portuguese worker, but under ideal conditions he never isolated anything, and did not believe that a bacterium had anything to do with yellow fever. If Prof. Kuczynski's work on the susceptibility of the guinea-pig were confirmed it would mark an entirely new era in laboratory technique. He only knew that he had injected a cubic centimetre of a vaccine, 1/10,000 of a gramme of which had killed a rhesus, into 12 guinea-pigs; after the whole staff had become tired of watching them they had been killed and found in prodigious health. Diphtheroids were the most treacherous of organisms, and of all bacteria which could be connected with yellow fever they were the class to be treated with the greatest respect. He required further evidence of their ætiological importance.

Reply.

Prof. **Kuczynski** replied that his criterion of yellow fever was the typical picture familiar to all those who had studied it. Costa Cruz had never maintained that his reaction was at all regular in rhesus. Prof. Bergmann had found that certain human cases showed a loss of complement. There was no destruction of the liver in guinea-pigs, but typical infections had been caused in rhesus monkeys after the fifth passage of the virus through guinea-pigs. Most of the infections had been long. Eight per cent. of monkeys produced new cultures if a very pure strain of virus was used, but the organism was not at all like the diphtheroid described in this paper. He had found absolutely nothing else. Purity of cultures depended upon the scrupulous care of the animals and the purity of the virus used. His experiments had fulfilled both these conditions. Careful tests had all been made with the contents of non-inoculated tubes before an inoculated tube was used. Material was only put into tubes which had been carefully tested for cleanliness. If these precautions were neglected, there was no wonder if a multitude of different organisms appeared in the culture. In reply to the suggestion that diphtheroids were not pathogenic, he could only point to his results, which he offered to repeat in the laboratory of a critic. Experiments on the toxin were nearing completion. Typhus could not be cultivated on his medium with human ascitic fluid.

CHELSEA CLINICAL SOCIETY.

A meeting of this Society, on Jan. 21st, with Mr. L. A. **Harwood**, the President, in the chair, was devoted to a discussion on

SWEATING.

Dr. C. E. **Sundell**, in opening, pointed out that the text-books made a number of diverse statements about the content and nature of sweat, and he thought their lack of agreement was largely due to the fact that different workers made their observations on different types of person. For instance, one book said that sweat was alkaline, another that it was neutral, and a third that it was universally acid. He thought that if the sweat were regarded as "cutaneous urine" this would give an explanation of the various reports on its composition. The best and most recent work on the subject stated that sweat was always slightly acid in reaction, just as the normal urine of a healthy person was always slightly acid. The degree of acidity of the sweat varied in different parts of the body; on the forehead, for instance, it was less acid than on the feet. Naturally, it was on healthy persons that most of the physiological work on the subject had been done; when dealing with certain forms of disease striking differences were noted. For example, with an angry big toe and a temper to match, the skin over a gouty joint was dry and hot, but if it was moistened and its reaction was tested, it would be found to be intensely acid, whereas the fellow big toe, which was healthy, would only show faint acidity.

Acute Rheumatism and its Treatment.

Dr. Sundell's own work on the subject had been mainly on sweating as a curative measure in rheumatic affections. Rheumatism seemed to be associated with some alteration in the activity of the skin. Patients with acute rheumatism were well known to sweat profusely, and their sweat was very acid. There was, however, an important exception to this rule —namely, acute hyperpyrexia. In this condition the patient who probably reached a temperature of 108° or 109° F. before he died was the patient who did not sweat. Two years ago he had a good example of that in hospital. The patient had a definite acute attack of rheumatic fever, with a temperature of 108° F., and his skin was bone dry and it was covered with tiny miliary lesions looking like blisters. The contents of these were acid, and he supposed the fluid in them was sweat which had not reached the surface. This patient failed to react to the many measures taken with the view to making him perspire, and he died, Dr. Sundell thought, because he did not sweat. Very probably the child of rheumatic tendency had gross imbalance of the cutaneous secretions. Sometimes the skin was dry, sometimes there were night sweats. Night sweats did not always mean that the particular patient was tuberculous. Broadly, it could be said that the rheumatic case of the chronic or subacute type perspired but little, whereas the acute type did so profusely and copiously.

He wished to speak particularly of the treatment of cases of rheumatism, and to relate a method, not his own, which he had found very successful. Suppose that a youth, aged 16, came into hospital with inflamed joints and with a temperature of 102° or 103° F. Probably the physician said, "Let us give him salicylates, bring his temperature down, and cure him." That was the course Dr. Sundell had himself adopted until he "saw the light." His present practice in these cases was to refrain from giving salicylates and to keep the patient warm in bed and promote sweating as much as possible—i.e., leaving the fever without any active treatment. If the patient did not sweat as freely as was desired perspiration could be increased by means of baths. On this treatment he had found that these cases of acute rheumatism cleared up extraordinarily well, and for good; for after this treatment he had not had the relapses and disappointing recurrences which were all too frequent after the salicylic régime. This warm bed and sweating treatment was that which was mostly relied upon before, about 1870, salicylates were first applied as a medicine to disease; the patients were given some alkali, put to bed, and encouraged to sweat, opium being administered if the pain was very severe. Dr. Sundell did not agree with those who said these children were suffering from an exacerbation of a smouldering infection; he did not think the lingering rheumatism in children had any relation to microbes.

As to the eliminative effect of sweating in other conditions, the older physicians, and some now practising, regarded sweating as one of the best means of protection against mercurialism when mercury was used in the treatment of syphilis. Especially if the sweating measures were accompanied by the use of vapour baths, stomatitis and other mercurial manifestations could usually be kept well at bay. An important part of the subject under discussion was the cause of night sweats and the best means of treating them. He recently had under care a tragic case in which night sweats were a striking feature; there was drenching perspiration several times a night. It was a case of advanced carcinoma, leading on to generalised carcinomatosis, and during the last three months of life the sweating was one of the most distressing features. A very large number of means were tried to stop it, but without any success until a homœopathist came along and suggested arsenic. Forty-eight hours after this was given the sweating stopped; Dr. Sundell could not explain why. Moreover, it did not recur for three weeks, and was then amenable once more to arsenic. The case just related had a gynæcological origin, and he had heard it said that the sweats associated with the climacteric were confined to the head and trunk, the arms and legs not being involved. He would like to know whether that statement was true.

Functions of the Skin.

Dr. **Henry MacCormac** said that when he was being taught dermatology he was led to believe that the skin was a gas-tight and water-tight envelope in which there were a number of sweat and sebaceous glands, and that the function of the skin, apart from them, was a protective one, shielding the body from external agencies, chemical, physical, bacterial. Sweat was said to be subordinate to the functions of the kidneys and little notice was taken of it. Santorius, a contemporary of Harvey, devised an ingenious balance on which he lay for days measuring the intake of food and fluid and weighing his excrement, and much of his results, arrived at after 30 years, stood at the present day. That authority described "sensible perspiration" and "insensible perspiration." By the first he meant the appearance on the skin of droplets of sweat, a condition which developed when the external temperature rose to or beyond 33° C. Experiments had shown that at the time this occurred there was a considerably increased discharge of CO_2 in the blood—i.e., about four times more than before. A French worker applied dry paper to his skin, allowed it to remain in contact with the skin 30 minutes, then soaked the paper in silver nitrate and exposed it] to the sun. There then appeared on the paper a number of white spots or points, which were caused by the sodium chloride in the sweat, and he said those points corresponded with the orifices of the sweat ducts and that insensible perspiration was given off during that period. He went further and applied belladonna and atropine to the skin, and demonstrated that where these had been applied this phenomenon did not develop. There was a congenital ectodermal effect in which people had a total absence of sweat glands, and in such persons investigations had been carried out on the effects of heat. It had been shown that in their case both water and CO_2 could pass through the skin; thus one could conclude that the skin allowed water and CO_2 to pass through it independently of sweat glands. This had been more recently confirmed by Prof. J. S. Haldane in his work on miners and others who worked in high temperature conditions, and therefore sweated profusely and drank large quantities of fluid. In the form of sweat these men passed out large quantities of sodium chloride, so that they actually suffered from a deficiency in the body of that compound, and this deficiency gave rise to a train of symptoms, such as cramps, debility, and weakness. Haldane had shown that this insensible perspiration could occur apart from the mediation of sweat glands. Miners got over the tendency to cramps and debility by eating some form of salt diet, such as kippered herring or kippered bloater in the morning.

Dr. **MacCormac** thought it important not to consider the sweat glands alone as such, but to take into account also the sebaceous glands, which were equally important and which worked with the sweat glands; indeed, the sebaceous glands could take on the function of the sweat glands. The sebaceous glands poured out a secretion on the skin which acted as an important protective substance; and he had often wondered whether the modern habit of taking one or two hot baths a day, accompanied by the liberal use of soap, did not remove from the skin this substance and possibly pave the way for a number of dermatological conditions. Sabouraud mentioned the case of a mother of seven children who brought three of them for a skin condition, which was thought to be contagious. It was found that only these three were attended to by an English nurse, and the condition of their skin was attributed to the assiduity of her washings. It was interesting to reflect that ringworm of the scalp died out at puberty. So far as he knew there was no physical or chemical change in the hair of the head at that time, yet, when that time of life was reached, something made the hair an unsuitable medium for the growth of the ringworm fungus. He thought that pointed to something developing in the sebaceous glands to bring about this change. And there was probably a variation in the constitution of those glands in various parts of the body, because although a man was no longer able to develop ringworm on the hair of the scalp he could easily develop it on the beard, and very seldom did ringworm develop in the hair of the moustache. Possibly something similar obtained in sycosis. The sebaceous gland secretion could often be modified by small doses of X rays.

Discussion.

Dr. **R. A. Young**, referring to the treatment of acute rheumatism, said that before the introduction of salicylates the treatment of that disease was stated by a cynical Guy's physician to be "six weeks," and the speaker thought that was a more effective treatment than that now adopted. As to Dr. MacCormac's remark concerning sites of selection for ringworm, if members of medical societies would bring forward puzzling cases and facts, as well as their experiences, more real research would be done in this way than was often done in laboratories, valuable though the latter was. A man who made a brilliant diagnosis of a case did more real research than did the man whose life was spent amid test-tubes. In the early years of his Brompton Hospital experience night sweats were a great trouble, and they resisted the various drugs and other efforts. They were not now a real trouble, for these tuberculous patients who suffered in this way were placed on a rush bed near a window. Yet the most striking example of sweating which he had seen in recent years was in a case of pulmonary tuberculosis. For this patient artificial pneumothorax was tried, but had little effect. Sanocrysin did improve it, but after four doses the benefit passed off and the sweating was as severe as ever. Then his house physician put the woman into a modern hot-air apparatus, and she was able to turn on and off at will the electric bath. This did her good, and the sweating subsided a good deal. He had since seen another case of sweating very considerably relieved by this apparatus. That the skin supported and supplemented the secretion of the kidneys was an idea which was considerably supported by the facts, and it accounted for the benefit derived from hot-air baths in renal disease.

Dr. R. L. J. LLEWELLYN spoke of the great susceptibility of rheumatic subjects to changes in the weather, and argued therefrom the need for special care of the skin, particularly in inuring it to tolerance by alternations of heat and cold, always concluding with a cold douche, to tone up the skin. All patients were questioned about the action of their bowels; but their skin functions were seldom inquired into. Nature was always trying to restore the endocrine balance. Patients with acute rheumatism could be said to have the sweating diathesis.

Dr. F. J. MCCANN said that in the treatment of the sweating seen in women at the menopause he had found great benefit from ichthyol.

LIVERPOOL MEDICAL INSTITUTION.

AT a meeting of this institution on Jan. 9th a paper on

Low Blood Pressure

was read by Dr. E. NOBLE CHAMBERLAIN. After dealing with the physiological principles underlying the maintenance of normal blood pressure, he described the various ways in which the blood pressure can be reduced in disease, as by weakening of the myocardium and diminution of vasomotor tone. First, however, he called attention to the occurrence of low blood pressure in normal people. In a group of 60 medical students and doctors, of ages varying between 18 and 33, as many as 15 showed systolic pressures below 110 mm. They appeared to fall into two groups, one with good physique, athletic habits, and complete freedom from symptoms, and the other, who were subject to minor circulatory disturbances such as chilblains and cold hands, and were often of a neurasthenic disposition. The former group were in no way below par either physically or mentally, and were capable of both sudden and sustained efforts. In view of the hypotension in this group it was considered not proven that the circulatory disturbances in the second group were necessarily related to the hypotension. Shock and hæmorrhage, said Dr. Chamberlain, illustrated types of extreme hypotension which might be fatal if the systolic blood pressure fell below 60 mm. The low blood pressure in these cases was due largely to diminution of blood volume, resulting from increased vasomotor dilatation, and increased permeability of the capillary walls, which possibly occurred from the toxic effects of histamine-like bodies produced at the site of the trauma. Direct diminution of blood volume occurred in hæmorrhage. In acute infections, such as diphtheria, pneumonia, and typhoid, the blood pressure usually fell gradually during the illness, slowly rising again during convalescence. Sudden drops were usually of ill omen, indicating the presence of such complications as cardiac failure in pneumonia or hæmorrhage in typhoid fever. Sudden rises were also apt to occur in the acute delirium of pneumonia or the perforation of typhoid ulcers. The cause of the hypotension in these conditions was probably to be sought in the effect of bacterial toxins and of the products of bacterial activity in the tissues on the vasomotor system—a theory with some experimental substantiation. In chronic infections hypotension was very constantly present in tuberculosis, and was usually proportionate to the severity and activity of the disease. In a series of cases investigated by Dr. Chamberlain there did not appear to be any direct relationship between the temperature and the hypotension, though low blood pressure was nearly always present when the patient was much emaciated. The hypotension in these cases was partly due, as in acute infections, to the effect of bacterial toxins and the products of bacterial action on the tissues, but might, he suggested, be due to histamine-like substances formed in the process of caseation. In cardiovascular diseases it was to be noted that hypotension was comparatively rare, except as a terminal event. In 100 cases analysed by Dr. Chamberlain there was only one case of hypotension—a patient who died 12 hours later. These cases were divided into: mitral disease, 29; aortic disease, 42; myocardial disease, 29. Cases were only accepted as myocardial damage which showed gross electrocardiographic changes such as heart block and bundle-branch block. Dr. Chamberlain, however, called attention to the fact that in a number of cases of infective endocarditis examined by him the blood pressure was low in about half the patients and never above normal, although the majority of cases were lesions of the aortic valve where high systolic pressures were usual. He considered, therefore, that hypotension in valvular disease of the heart, unless accompanied by marked signs of cardiac failure, is suggestive of infective endocarditis, particularly if the course of the blood pressure is progressively downwards. Here, as in all cases, the value of knowing the individual's blood pressure variations in health was to be emphasised. That a fall in blood pressure would occur in infective endocarditis was to be expected, when one considered the frequency of hypotension in other infections. In endocrine disorders it had long been known that hypotension was a common feature of Addison's disease, but cases had been described recently where the blood pressure remained normal in spite of the advance over many years of all the other characteristic symptoms of the disease. This, and the experimental evidence that destruction of the suprarenal medulla in animals was often accompanied by no ill-effects and that the amounts of adrenalin in the blood of normal beings was not sufficient to produce vasoconstrictor effects, made untenable the theory that the low blood pressure of Addison's disease was due to deficiency of adrenalin owing to destruction of the suprarenal medulla. The cause of the hypotension remained unexplained. In cases of pituitary insufficiency, as in Fröhlich's syndrome, low blood pressure was also common, probably owing to lack of pituitrin which might exert a pressor effect in the normal animal.

In speaking of treatment Dr. Chamberlain followed the lines of his article in the series on Modern Technique in Treatment in THE LANCET (1929, i., 889).

MERSEYSIDE HOSPITALS.—Last year the ordinary income of the Liverpool Voluntary Hospitals was £286,464, and the expenditure £314,337, leaving a deficit of £27,873. The necessitous persons who were treated without any payment numbered 8000; their aggregate stay was 138,000 days. The four Liverpool Hospitals spent £6600 in dressings, and £7271 in drugs. There were 10,445 cases for X ray treatment, and 480 for radium treatment, and 17,544 operations were performed. Attendances for electrical massage treatment were 127,121 and for artificial sunlight 11,605. The annual cost of the maintenance in hospital of persons unable to contribute to the penny-in-the-pound fund is stated to be at least £70,000.

Reviews and Notices of Books.

PROBLEMS OF NEUROSES.

By ALFRED ADLER. With a Prefatory Essay by F. G. CROOKSHANK, M.D., F.R.C.P. Edited by PHILIPPE MAIRET. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1929. Pp. 178 + xxxvii. 8s. 6d.

Dr. Crookshank opens with a lively criticism, in which most psychopathologists would concur, of what Biot has called the necrological and veterinary schools of orthodox medical thought. He then points to a great, though unofficial, therapeutic advance, instanced in the new methods by which the cardiac neuroses—sources of suffering and wastage greater than that due to the so-called "organic" heart diseases—have, after centuries of neglect since Harvey's time, become more amenable to treatment than are fibrillation, heart-block, and flutter. Believing that the most important contribution to the psychological school of medical thought will prove to be due to Alfred Adler, he gives a description of that physician's theory of organ inferiority, as applied to physical dysfunction and disease or the development of neurosis. Then follow an account of individual psychology and an eulogy of Adler "who, in easy, pleasant, simple sentences, helps us to solve the greatest and most important problem of all, that of understanding human nature." The case-histories related by Adler himself emphasise his view that the neurotic symptom is designed for an end; they show, too, how the psychotherapist, by convincing the patient of this end, induces him to renounce it and take up anew the task of life. Adler's ready insight into human motives is manifest, and we can picture him successfully leading the patient along the road to self-understanding. It is difficult, however, to find any relation between his methods or views and psycho-analysis, although Dr. Crookshank tells us that the Freudian methods of investigation are frankly accepted by the author. It is true that he offers his interpretations of patients' dreams, but there is no hint of the revival of emotional memories not already accessible to consciousness—which is, historically and practically, the foundation of psycho-analysis, the key to the comprehension of the theory of the unconscious. The influence of such memories in the production of symptoms is equally ignored by Adler. The neglect of this aspect leaves, as it were, a naked-eye pathology, easily understood because it remains on the level of consciousness already familiar to us and makes no demands upon new conceptions of mental processes, but unsatisfying to anyone whose work has forced him to use such conceptions. There is ample scope for the application of Adler's methods among the multitudes of neurotic patients, but his theory covers only a part of our knowledge of psychic mechanisms.

A MANUAL OF MIDWIFERY.

For Students and Practitioners. Fourth edition. By HENRY JELLETT, B.A., M.D., F.R.C.P.I., L.M., late King's Professor of Midwifery, Trinity College, Dublin; ex-Master of the Rotunda Hospital; and DAVID G. MADILL, B.A., M.B., B.Ch., B.A.O., L.M., Gynæcologist to Adelaide Hospital, Dublin; ex-Assistant Master of the Rotunda Hospital. London: Baillière, Tindall and Cox. 1929. Pp. 1281. 25s.

EXTENSIVE revision has been found necessary in the preparation of this fourth edition of the Manual of Midwifery, and the authors have not hesitated to make use of experts in special subjects, while numerous recent references are given. The book, in fact, is up to date and complete in the letter of obstetrics; it is therefore regrettable that its spirit remains that of the obstetrics of ten years ago. The preventive side of midwifery is not given the prominence which it now deserves, and the inclusion of chapters on the various aspects of midwifery treated from this point of view would greatly enhance the value of the work. It is, however, well arranged and clearly written; its chief appeal will be to the post-graduate student and to the teacher.

In the main, the teaching is that of the Rotunda, although the book is not merely an exposition of Rotunda methods without due reference to others. It has one fault, besides the neglect of the preventive side, which is common to most text-books on midwifery; the minor abnormalities found during pregnancy are not given sufficient prominence. In practice major diseases and abnormalities are rarely missed, and usually receive correct treatment by the practitioner; but the minor degrees of disproportion, doubtful cases of postmaturity, and signs suggestive of early toxæmia tend to embarrass the medical adviser, especially when the text-book of his choice has not warned him of the frequency with which he will have to deal with them.

It is almost impossible to combine in one work definite teaching in preparation for examinations, instruction for the practitioner, and a philosophic outlook which will embrace the preventive as well as the curative side of any branch of medicine. This work succeeds in providing the first two of these in good measure, and readers must be content to look elsewhere for the third.

HYGIENE AND PUBLIC HEALTH.

(*Parkes and Kenwood.*) Eighth edition. Revised by HENRY R. KENWOOD, M.B., D.P.H., Emeritus Professor of Hygiene and Public Health, University of London; M.O.H., Bedfordshire; and HAROLD KERR, O.B.E., M.A., M.D., D.P.H., Professor of Hygiene and Public Health, University of Durham; M.O.H., City and County of Newcastle-upon-Tyne. London: H. K. Lewis and Co., Ltd. 1929. Pp. 823. 21s.

THIS manual was originally written by Dr. Louis C. Parkes, with whom Prof. Kenwood entered into collaboration in later editions, and now Prof. Harold Kerr has joined with Prof. Kenwood in bringing it up to date. Many passages have been deleted and the space filled with new material, the editing having been so cleverly done as to provide connected teaching; thus "Parkes and Kenwood" retains its high place in the rank of text-books in public health.

A book of this kind will always show variations in quality depending on the personal interest of the authors in the different branches of public health. We find, for instance, that the chapter on air and ventilation is excellent, although the description on page 154 of the relation between ventilation and diphtheria is not very scientifically expressed. The chapter on warming and lighting is likewise very good, although here, too, one misleading statement is made at the very commencement, which gives the impression that the desideratum in a good heating system is warming of the air. It would appear desirable to avoid reference to such commodities as smokeless fuel by commercial names, since many of those sold under proprietary names are of equal merit. In the chapter on infection the discussion of susceptibility and immunity is hardly adequate. No attempt is made to estimate the significance of modern observations on the transmission of communicable diseases in relation to mass immunisation by unrecognised infections. In places throughout the book various means of attaining an object are described without discrimination as to their relative value. This criticism, for instance, applies to the descriptions of the treatment of swimming-bath water with "electrolytic fluid" or continuous filtration. In the same chapter considerable space is given to the description and illustration of the sterilisation of water by means of ultra-violet radiation; if, as we believe, this is a very costly method, it is desirable that students should be told so. It is not strictly accurate to say that glass is a complete absorber of ultra-violet rays. On page 210 a reference to carbonic oxide appears to be intended for carbon monoxide.

In noting a few points for criticism we do not want to imply that they are important. The book in its revised form will be justly valued by all advanced students of public health and it will be used for reference in public health departments throughout the kingdom.

English Public Health Administration. By B. G. BANNINGTON, Sanitary Inspector, County Borough of West Ham. London: P. S. King and Son, Ltd. 1929. Pp. 325. 12*s.* 6*d.*

THIS second edition of a very useful work appears at an appropriate time in view of the reform of local government which the Act of 1929 is intended to bring about. Mr. Bannington has brought his book into line with present day public health law and practice, though fully aware that consolidation of the law will soon make it out of date. The range of the service is well covered, although the more modern and specialised medical branches of the work, such as those concerned with the health of school-children, venereal diseases, and mental deficiency, receive rather scant notice. The significance of the expansion of these important services might have been utilised more freely to emphasise some of the points the author sets out to make. Apart from this, the book contains much valuable information, some of which will be new even to those who administer health departments and teach methods of administration to others. It should find a place in the library of every medical officer of health, and will convey to students of public health a vivid idea of the service for which they are preparing.

INFECTIOUS DISEASES AND OTHER FEVERS IN INDIA. A Manual for Students and Practitioners. By PURSHOTAMDAS T. PATEL, M.D. Lond., M.R.C.P. Lond., D.T.M. & H. Cantab., Medical Superintendent, City Isolation Hospital and Maratha Plague Hospital, Bombay. Calcutta: Butterworth and Co. 1929. Pp. 784.

THIS is a handbook on fevers for the use of students and practitioners in India. The impression conveyed by a perusal of the book is that the material is incompletely digested and hastily arranged. Misprints are frequent, especially when the writer deals with scientific nomenclature. The reader will find much to criticise in the distribution of space. For example, a discussion of yellow fever, a disease which has never occurred in India, is included, while only two pages are devoted to undulant fever.

JOURNALS.

BRITISH JOURNAL OF CHILDREN'S DISEASES. Vol. XXVI. October–December, 1929.—In a paper on Experimental Pyelitis and its Relationship to Urinary Infections in the Infant Dr. H. F. Helmholz, of the Mayo Clinic, records experiments on rabbits which seem to favour the ascending mode of infection. The frequency of infection of the bladder, as compared with infection of the upper portion of the urinary tract, together with the fact that the colon bacillus after intravenous injection does not persist in the bladder when the upper part of the urinary tract is sterile, seems to indicate that in the rabbit the infection is of the ascending type. Although results from experiments on animals cannot be directly applied to man, there is enough confirmatory evidence from what is known of pyelitis in infancy to warrant the assumption that infections with the colon bacillus take place in the same way. In conclusion, Helmholz emphasises the importance of making a bacteriological examination of every case of pyelitis before a cure is pronounced, and of referring to a urologist for a careful study of the urinary tract all the cases in which the condition does not clear up after an intensive course of treatment by methenamine.—Dr. Leslie Cole and Dr. C. H. Whittle contribute a paper on Congenital Obliteration of the Bile-ducts, with a description of two cases in infants aged 5 months and 8 weeks respectively, and an account of the post-mortem findings.—In a Note on Combined Congenital Ectodermal Defects Dr. F. Parkes Weber points out that during the last 50 years a great many congenital and often familial ectodermal defects have been studied, including congenital alopecia, congenital hypotrichosis, monilithrix, and hypoplasia pilorum moniliformis often associated with more or less keratosis pilaris, various forms of congenital aplasia or dystrophy of nails, congenital dental aplasia, congenital anhidrosis, congenital asteatosis, and familial epidermolysis bullosa. Various examples of the association of these defects are quoted from the literature, and an annotated bibliography is appended.—Dr. Walter R. Bett contributes an article entitled Some Pædiatric Eponyms: Pirquet's Reaction, which contains a translation of Pirquet's original description of the reaction published in 1907, and a sympathetic sketch of his career, illustrated by an excellent portrait with his autograph.—The abstracts from current literature are devoted to treatment.

INDIAN JOURNAL OF MEDICAL RESEARCH. Vol. XVII., No. 2, October, 1929.—This number comprises some 28 papers, of which it is possible to give only the shortest summaries. D. C. Wilson and V. E. Pilley, under the ægis of the Indian Research Fund Association, have studied osteomalacia in India.—R. N. Chopra and his collaborators continue their studies on Indian drugs, and contribute papers on the kut root (*Saussurea lappa*), the pharmacological action of pseudo-ephedrine from the Indian varieties of ephedra, and observations on certain medicinal plants used in indigenous medicine.—I. M. Puri describes the male, female, egg, and larva of *Anopheles annandalei*, var. *interruptus*, and *Anopheles sintoni*, a new tree-hole breeding species.—H. H. King, C. G. Pandit, K. P. Menon, and I. P. V. Seetharama have made a thorough house-to-house filariasis survey in Saidapet with a note of the source of filarial infection in mosquitoes, and have also worked out the development of the filaria of the lizard, *Corrispiculum guindiensis*, in *Culex fatigans*. Both these papers are of very great importance to those interested in filariasis.—R. McCarrison has made further studies on the production of lymphadenoid goitres in rats.—T. A. Hughes and his assistants contribute papers on the effect of bile-salts, serum calcium, and phosphorus in health and disease.—K. V. Krishnan has attempted to standardise the antigen used in the syphilis flocculation reaction.—S. R. Christophers has made a collection of the anopheline and culicine mosquitoes from Madeira and the Canary Islands and here describes them, and also writes on hæmolysis by acid and basic quinine salts.—M. B. Soparkar has found a case of bovine tuberculosis in man in India.—R. B. Lloyd and S. N. Paul have investigated the serum protein changes in malaria and typhoid fever, and suggest that they bear some relation to immunity.—L. A. P. Anderson, M. G. Coombes, and S. M. K. Mallick have studied the interesting dissociation of *Bacillus avisepticus*, M. L. Ahuja has observed the electrical behaviour of rough and smooth variants of *B. typhosus*, and H. E. Shortt, R. O. A. Smith, H. A. H. d'Silva, and C. S. Swaminath have demonstrated *Leishmania donovani* in the fæces of a case of kala-azar.

MELKSHAM COTTAGE HOSPITAL.—Lord Radnor, Lord-Lieutenant of Wiltshire, last week opened an extension of this hospital which increases the number of beds to 31. The additions comprise a women's ward with nine beds, and a children's ward adjoining with eight cots. The opening coincided with the diamond jubilee of the foundation of the hospital.

THE LANCET.

LONDON: SATURDAY, JANUARY 25, 1930.

NOMENCLATURE OF RENAL DISEASE.

Existing classifications of Bright's disease are confusing and unsatisfactory, and it is not necessary to refer to text-books in order to make this discovery, because every medical man and, for that matter, every medical student is aware of the fact. There is, in fact, no branch of medicine in which dispute as to classification has been more active and unanimity more unobtainable. Terms such as chronic interstitial nephritis, parenchymatous nephritis, tubal nephritis, arterio-sclerotic kidney, and so forth, are employed in medical literature, but with different significations by different writers, and accessory labels, such as large white kidney, contracted kidney, granular kidney, and so on, are offered as alternatives or synonyms until the reader's mind is clouded. The magnificent attempt of Bright to correlate his clinical discoveries with post-mortem observations yielded results which for a time increased the general knowledge concerning diseases of the kidney, but it has long become apparent that naked-eye morbid anatomy is insufficient as a guide to the pathological processes present. Modern histological research, particularly in Germany, under the auspices of Aschoff, Volhard and Fahr, and Müller has, in recent years, opened up new avenues of investigation, and for many months advanced students of medical science in this country, amongst whom we include physicians of great experience and laboratory workers of established reputation, have awaited the publication summarising the work on nephritis which has been carried out during a long period in the Institute of Pathology at the London Hospital by Prof. Turnbull and his assistants. This has now emerged in the form of a report by Dr. Dorothy S. Russell, a brief summary of which appears on p. 204.

Dr. Russell's proposed classification represents an advance beyond the generality of orthodox teaching, and it is certain that the majority of serious writers in this field, whether in Great Britain, France, the United States, or Germany, will agree that it is closely in harmony with the views which they have individually expressed during the past decade. In the first place, she recognises a purely ischæmic group of renal degenerations, entirely separate both in its pathological and its clinical manifestations from the inflammatory group proper. It is the group to which Gull and Sutton originally drew attention, and Dr. Russell's work confirms the views of those who have maintained that, conspicuous as are the changes seen in the kidneys of such patients in the post-mortem room, they rarely present themselves clinically as obvious cases of renal disease, since the renal function is seldom sufficiently affected for the production of uræmia and its preceding symptoms unless a true toxic nephritis is superimposed upon the condition. In an introductory chapter Dr. Russell points out that this group cannot properly be included in the term "nephritis" or "Bright's disease," and then immediately proceeds to do so. Nor is it easy to see how she could have done otherwise, particularly as the average clinician has for years unconsciously confused this group with the more chronic forms of true renal inflammation. Having dealt with this important group, Dr. Russell proceeds to place all the true inflammations under the heading of "toxic nephritis," subdividing this into mild nephritis ("nephritis mitis") and intense nephritis ("nephritis acris"). The first of these divisions is admittedly nothing more nor less than the group which, under the name of "nephrosis," has caused vigorous controversy in all countries during the last ten years. As far as can be ascertained from a perusal of the report, the pathological department of the London Hospital has now given wholehearted adhesion to the contentions of Epstein and of the modern German school. In view of the recent criticisms by H. Gainsborough[1] and H. A. Christian,[2] this is a very significant fact; but it leaves the student in some perplexity as to why the term nephrosis, which has had the merit of provoking thought, has been abandoned in favour of a Latin word of somewhat vague significance. In the group "nephritis acris" is included the welter of cases in which active inflammation of the kidney is seen in all its early and late manifestations. "Nephritis repens" is regarded by Dr. Russell as a sub-group of nephritis acris, although she admits unfamiliarity with any of the early stages of inflammation leading up to the terminal condition of advanced renal inflammation of sclerotic and degenerative character which distinguishes this group. The text hardly makes it sufficiently clear to the reader that this is, in her opinion, a sub-group rather than a main category.

It is not in any way to belittle the importance of this work if we suggest that the difficulties are stated and helpfully discussed rather than solved. In spite of the amount of skilful labour that has been devoted to the compilation of the report, it is clear that it contains much controversial and some hypothetical matter. While proper stress is laid on certain biochemical tests and the deductions to be drawn from them, little or no reference is made to the important advances in biochemistry dealing with the composition of the body fluids, which have recently thrown so much light on the significance of œdema in various types of Bright's disease. The omission is perhaps a wise one. But we cannot help fearing that in evolving a classification of nephritis in harmony with the opinions of the majority of advanced workers in all countries to-day, Dr. Russell has imperilled the utility of her admirable investigations by proposing three new descriptive terms. It is given to few to recast the currency of a common topic and, unless these terms receive wide and early adoption, the unfortunate student will be plunged still more deeply into the bog of confusing nomenclature. This does not impair the value of the report as a classical study of the histology of Bright's disease.

MENTALITY AND ANÆSTHESIA.

It happens not seldom in the practice of medicine that some of the more vague and ill-defined factors in a case may yet be those of the greatest importance. We reckon among the ill-defined factors in an ordinary surgical patient all those attributes which may be included under the term "mental make-up," and it is interesting to see how striking a part these attributes may play in determining the behaviour of the patient under anæsthetics; interesting, and yet, it seems, not enough attended to. In a contribution to the current number of the *British Journal of Anæsthesia* Dr. Dudley Buxton deals partly with this aspect of the practice of anæsthetics, and calls to mind how the rôle played by the mental state of the patient may affect response to the selected drug. But his excellent dissertation is more closely concerned with the connexion between physical qualities in the patient and the production of anæsthesia. Every practising anæsthetist is aware of the striking difference displayed by different patients in their reaction to anæsthetic drugs; he does not always realise, however, how largely that difference is an affair of the psychological, rather than the physical state of the subject. The teacher of anæsthetics is accustomed to point out to the students under his instruction the discrepancies between the way in which the typical heavy physical worker—the coal-heaver, for example—reacts to an inhaled anæsthetic, and the reaction displayed by an underfed shop assistant. Dr. Buxton points out, similarly, the contrast between the behaviour of the thick-necked, red-faced, muscular subject and the thin pale female when submitted to anæsthesia. But while he is careful to accentuate the many differences in behaviour under anæsthetics occasioned by differences in physique, he is, we think, not so anxious to bring to mind the very extraordinary differences in conduct which are entirely dependent on psychological differences in patients.

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[1] Quart. Jour. Med., 1929, xxiii., 101.

[2] The Lancet, 1929, ii., 340.

Now, to our thinking, this source of difference in behaviour is often more important and more influential than any produced by the variations in physical attributes. It is, for one thing, doubly important because of its very lack of obviousness. All the precautions necessary are likely to be taken to counteract undesirable results that may arise when the causes of the possibility or probability of these results are plain. When there is no such clear indication, then the precautions may be neglected, and the unwished-for phenomena, when they arise, may be difficult to cope with. There are, for example, people who give no indication by their behaviour at the start of inhalation, or by their manner generally, that they will show any peculiarity with regard to the effect of anæsthetics. They are, also, apparently of ordinary physique. Yet very early in the course of the induction of anæsthesia they are seized—it may be suddenly seized by such violent mental excitement, resulting in extreme precipitate muscular action, that they may hurl themselves from the operating table before any attempt at control can be made. Fortunately, examples of this peculiarity in its severest form are unusual. But they are not too rare for every anæsthetist of experience to have encountered them once and again. The explanation of this unexpected, uncontrollable, and unconscious activity of the voluntary muscular system is in all probability to be found in impulses arising from the cells of the lower layers of the cerebral cortex, the presumed seat of the "unconscious mind." And the impulses arising from this site are due to impressions placed there by previously received stimuli, these stimuli having been received generally during consciousness. This hypothesis at any rate offers a simple explanation for the familiar fact that the kind of phenomena we are considering here were unusually common among men who had endured the horrors of prolonged trench warfare and the stress and emotion called forth on the battlefield; these being subsequently repressed in ordinary life had so stamped themselves on the brain that the moment conscious control was withdrawn they took command. The officer who had led his men over the top leaped from the dentist's chair to do the same again, and the private soldier, who had saved his own life by dealing another a death-thrust with the bayonet, hurled the attendant nurse away from the table by which she stood while he became unconscious. These violent exhibitions which occur after the patient has lost consciousness may be regarded as the outcome of a kind of dream, and the relationship is well recognised between dreams, the hallucinations of unstable minds, and the mental states which occur in association with anæsthetic drugs.

It is of the first practical importance that the mental aspects of anæsthesia should be fully recognised, and that every step should be taken to ensure that the experience leaves no unpleasant, certainly no terrifying, impression. This is of particular importance with children, for, wrongly managed, the administration of anæsthetics may plant in a child's mind a fear which throws a shadow over his whole life, and which will certainly render any subsequent entrance to anæsthesia, should one become necessary, dreadful to the patient if not really dangerous.

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MEDICINES IN THE MASS.

It is recorded that one, Samuel Jessop, who died at the age of 65, in the year 1817, had such an inordinate craving for physic that in 21 years he took no less than 226,934 pills, besides 40,000 bottles of mixture; and in 1814, when his appetite increased, his consumption of pills was 51,590. "Truly," says William Ward, in whose quaint memoirs we find this remarkable story, "he must have thought with the prophet, 'The Lord hath created medicines out of the earth, and he that is wise will not abhor them.'" In the absence of evidence to the contrary it may be assumed that the late Mr. Jessop holds the record as a pill swallower, but there were others who ran him pretty close as, for instance, David Hartley, who ate 200 lb. weight of soap, and a certain bishop who drank a butt of tar water. From all this it seems clear that the Englishman's fondness for medicines is no new thing, but rather is a tradition that has been handed down from father to son. And so, as Steele observed, there arise in one generation after another quacks and those that are their prey. More than 100 years ago England was called the "paradise of quacks," and the title still has its claim. In the nature of things there is, of course, a difference between the nostrum monger of to-day and his prototype of old, for this is an age of mass production, while the other was an age when output was limited to the capacity of a man's hand. But in spite of, or because of, mass education, the credulity of the public is unchanged and unchanging. There is probably as much money spent on teaching the people that quack medicines are good for them as on any other single purpose, and so long as the nostrum industry is allowed to say what it likes, and the newspaper industry is allowed to print what is said, quackery will continue to flourish.

It is a deplorable fact that public opinion is not against secret remedies; but so much money is being spent on educating the public to believe in them, that the public intelligence is perverted. We have made some progress, it is true, to arrest the evil. For instance, no Government in our time has engaged in the quack medicine business; this is a step forward, for in times past governments have paid large sums for the purchase of nostrums. Thus in 1739, the House of Commons voted £5000 to Joanna Stevens for a solvent to remove stone, notwithstanding which, said a writer 90 years later, "there have been as many human calculi, since formed by His Majesty's liege lithotomical subjects, as would macadamise one side of Lincoln's Inn Fields." Incidentally, it was DAVID HARTLEY, the soap fiend, who was instrumental in obtaining this grant for Mrs. STEVENS, and it is sad to reflect that he himself died of the stone. The Parliament of England went out of the quack medicine business many years ago, and the moral outlook has been improved to that extent; but it is humiliating to have to admit that beyond ceasing to encourage quackery no Government in this country has done anything to discourage our Jessops or to protect medicine-taking dupes from medicine-making pretenders. Let us make our position quite clear. We do not condemn proprietary medicines en bloc, while we deplore the license enjoyed by the vendors of worthless remedies. Here we feel it to be our duty to point to the need which exists for some restraint on the zeal of those engaged in the traffic. Just before the war there was a Bill before Parliament which aimed at the prevention of some of the abuses which are part and parcel of this unwholesome business, and there were good prospects of the measure passing into law, notwithstanding the several vested interests which it affected. The Bill was based upon the recommendations of a Royal Commission (published as a supplement to THE LANCET, Jan. 10th, 1925), and by its main provisions it sought to prevent the sale and advertisement of "cures" for incurable diseases, and to prohibit the making of unjust claims as to what a secret remedy could do. It attacked only the obviously fraudulent side of the industry, and left open for exploitation by drug makers, enthusiastic for their own preparations—an even wider field than is available for cultivation in any other civilised country. We would that the present Government, despite its obvious lack of time in which to meet its commitments, would take this Bill out of its pigeon-hole and at least give it an airing. No honest man would stand to lose anything if it became law, and no hypochondriac would be stinted unduly in the practice of his hobby. The secret remedy evil is rapidly increasing in this country because ours is the only nation which does nothing to check it. Profits are being made among us by aliens through methods which if employed in the land of their birth would render them liable to segregation as enemies to society. This is a preposterous state of affairs. Mass production, big newspaper circulations, and ever-widening of the channels of distribution are continuing to spread the evil to such an extent that it may soon become a national vested interest, and as such be almost impossible to destroy. Our staple industries are in a bad way, unemployment and shortage of money are acute; and yet the turnover of quack medicines is bigger than ever it was, and many people are spending on rubbish what they ought to be spending on food. Our administrators should look into this matter; the spade work has already been done, and, as we have said, the appropriate Minister will find waiting in his Department a considered measure which if passed into law would afford some protection for the ignorant and quell an abuse which humiliates this country in the eyes of the world.

We do not think that pharmacists as a class would oppose the desired legislation, notwithstanding that it is through their hands that proprietary articles and secret remedies are passed to the ultimate consumer. In a recent statement, which has been accorded wide publicity, the President of the Pharmaceutical Society advised chemists to set their faces against the sale of drugs through automatic machines. There are obvious reasons why such a method of distribution should be condemned, and one of the reasons stressed by the President was that the employment of automatic machines by chemists detracts from "the personal value of their services to the public." This is true enough, and it is none the less true that a pharmacist who sells to the public a ready-made packet of a compounded drug of whose ingredients he is kept in ignorance by the manufacturer is also doing something which detracts from the personal value of his services. In the one case it is the pharmacist who employs an automatic machine and in the other it is the proprietor of the advertised nostrum who employs the machine; in the one case the machine is made of wood or metal and in the other case the machine is an educated human being. What personal service does the pharmacist render to the public when he hands over to a purchaser a box of pills he knows nothing about? Quite obviously he is rendering a disservice if he knows that the pills cannot possibly do what the advertisements claim for them. We regard the pronouncement of Mr. MORETON-PARRY valuable both in the interest of pharmaceutical chemists and the public; carried to its logical conclusion this statement must have a wide influence on the distribution side of the secret remedy industry. The time may come, and we hope it is not far distant, when British pharmacists will come into line with their Dutch confrères. As was recorded in our last issue (p. 168), at the instigation of the chemists in Holland a commission has been framed for the purpose of controlling the advertisements of medicinal preparations. This is highly commendable on the part of the Dutch chemists, and we hope that the President of the Pharmaceutical Society will carry his campaign against the automatic distribution of drugs a step further by advising action by the members of the Society, over which he presides so judiciously, on the lines of the Dutch programme.

Annotations.

"Ne quid nimis."

VITAL STATISTICS FOR 1929.

THE Registrar-General has issued a provisional statement of the figures for birth-rate, death-rate, and infantile mortality during the year 1929.

—	Birth-rate.	Death-rate.	Infant mortality-rate.
England and Wales ..	16·3	13·4	74
107 county boroughs and great towns, including London ..	16·7	13·8	79
157 smaller towns ..	16·0	12·3	69
London	15·9	13·9	70

The smaller towns are those with a population in 1921 of 20,000–50,000. The death-rate for England and Wales (which is based on the estimated population for 1929) relates to the whole population, but that for London and the two groups of towns (based on the 1928 estimate) to the civil population only. Birth-rate and death-rate are per 1000 population. Infant mortality-rate per 1000 live births.

The Registrar-General remarks that the birth-rate is 0·4 per 1000 below that of 1928 and is the lowest recorded. The death-rate is 1·7 per 1000 above that of 1928, a rise practically confined to the first quarter of the year, and due to the epidemic of influenza in the spring and the severe weather in that period. The infant mortality-rate has increased from 65 to 74 per 1000 live births, a rise probably due to the same causes. These provisional figures, which are not likely to require substantial modification, have been issued for the information of medical officers of health.

AN AUSTRIAN THAUMATURGIST.

Our Vienna correspondent tells us of the widespread fame as a wonder-healer achieved by a man named Valentin Zeileis in the small village of Gallspach in Upper Austria. Zeileis, who is now 56 years old, is a former peasant who has been experimenting with electricity from his boyhood, and has for 20 years past had wide vogue among his brother peasants. Now hundreds, even thousands, of patients are flocking daily to his office, where they have to disrobe *coram publico* and are seen by the "doctor" (as he is called) simultaneously in groups of 10 to 15. The great man uses a "diagnostic rod," being a glass tube containing radium emanation through which is passed a powerful high-frequency current. This rod or wand is moved over the body of the patient until it becomes fluorescent over any diseased or abnormal part. There is no doubt about the fluorescence, for the patient can see it, but its provenance is obscure to everyone but Zeileis himself. The treatment is then ordered. This consists chiefly of electro-static, high-frequency current, or hard X rays applied several times within a minute or two, or some combination of these with radium. The course of treatment lasts for 10 days or a fortnight, sometimes longer, when, our correspondent is assured, many patients who have already suffered at the hands of their own medical men return home relieved of their troubles. The place is in fact a veritable Lourdes, which it resembles in the nature of the diseases cured, which are mainly of a neurotic type with a sprinkling of rheumatic and pseudo-paralytic affections. Naturally all sorts of other sufferers, medical and surgical, come to seek Zeileis's advice, and he is shrewd enough to recognise where suggestive treatment will be useless or harmful, sending some away and sending others to medical men who believe in him, or at least affect to do so. Ethically the situation is interesting, for Zeileis's eldest son, who is working with him, has obtained the degree of M.D. in Austria, which, our correspondent says, makes it impossible to charge the father with quackery, as has been done on several previous occasions. When these cases came before the Court, numbers of staunch believers, of cured patients, and even of medical men, supported Zeileis's claims, with the result that he has remained unmolested since. He charges no fee for his services, but is always offered a trifle. Lately, in response to vehement attacks from the medical side, he has publicly disclosed the nature and technique of his electrical treatment, as briefly outlined here, and no doubt his experiments will be repeated in other quarters. It seems to be admitted that he and his assistants have had good results in some grave cases. In the last stage of this remarkable story Zeileis and his son have built an enormous institute in Gallspach, fitted up on the most up-to-date lines, in which 6000 patients can be treated a day. Here not only electrical but also other kinds of physical and hydrological treatment are given. Our correspondent remarks, in conclusion, that the flocking of ill persons to such centres is an indication that current medical knowledge does not (in Austria) completely satisfy the needs of suffering mankind.

REMEDIES FOR SEA-SICKNESS.

For sea-sickness Dr. Karl Muley,[1] of Istambol (Constantinople), gives good reports of a preparation called "otreon" (Höchst), recommended as an antacid. The tablets contain carbonates of bismuth and of magnesia, with 1 per cent. of papaverine and a foam-producing element, and Dr. Muley has found that they relieve nausea ashore. Thinking that the discomfort of sea-sickness is due to the dragging of viscera on the nerves of the diaphragm or peritoneum it seemed to him likely that papaverine would dull the afferent impulses from that region and so allay the vomiting, while the foam produced would distend the stomach and ensure that the papaverine made contact with the whole surface of the mucous membrane. The tablets, two of them, are to be taken with or without water, and swallowed whole. Relief has come in most of his nine cases within half an hour. It may be noted in passing that one of the literary magazines for November of last year recommends two forms of treatment for sea-sickness—one of them ginger-beer and the other antacid drugs. Their virtues are perhaps combined in this of Dr. Muley's. Possibly gas in the stomach may help to prevent the viscera from moving separately. Tight belts are often worn with this object.

Atropine as a vago-depressor has been in vogue for sea-sickness since 1913, and has proved of undoubted value. J. Bohec,[2] surgeon on the trans-Atlantic liner *Ile-de-France*, states that until last year he used atropine sulphate, but found it to have certain disadvantages. Its action is brief owing to rapid elimination, and the danger of poisoning makes it an unsuitable remedy for self-administration. In some cases the depressor action on the vagus is associated with a stimulation of the medulla, and hence of the vomiting centre; this type of case has been found to respond to atropine and morphia administered together. In 1927 Fischer suggested the use of lævo-rotary hyoscyamine, with scopolamine and mandragora; with these drugs the vago-inhibition of the hyoscyamine is augmented by the scopolamine, while the stimulation of the medulla due to the hyoscyamine is opposed by the depressor action of scopolamine on this centre. Bohec, working on the same principle, now employs a preparation of all the alkaloids of belladonna in the pure state, called "bellafoline;" this contains hyoscyamine, scopolamine, choline, asparagine, chrysatropic acid, and other alkaloids. The action is twice as marked and twice as long in duration as that of atropine, hence the dosage is smaller and safer; the toxicity is equal to that of atropine. Bellafoline can also be used in combination with a narcotic having a central action such as gardenal, and Bohec has made use of a preparation of this kind known as "belladenal." Bellafoline is taken before embarkation and during the early days of the voyage, and subsequently a tablet can be taken when the traveller feels an attack to be imminent. In the case of acute sea-sickness without employment of previous preventive measures it is stated that bellafoline has been given hypodermically with good results.

THE CHICAGO WORK ON INFLUENZA.

Prof. Falk and his colleagues have now made a preliminary report[3] on their work on influenza. The investigation consisted in the bacteriological examination of the blood and upper air-passages of patients and the experimental infection of monkeys, with subsequent cultural examination of these animals and further serological work. During the height of an epidemic in Chicago 1928–29 16 rhesus and capuchin monkeys were sprayed with material from eight human cases of influenza or from monkeys infected from them. Many cultures were made and examined from human patients. Twenty-eight monkeys were given a disease "closely resembling influenza" by spraying the nose and throat with 12 cultures of the presumed causal organism obtained from the blood of patients or by exposing them to contact with infected animals. The proportion of successful results with the two methods is not stated. Mild clinical influenza was produced in three rhesus monkeys caged with one which had been infected by spraying. Some evidence of antibodies to the cultures used was also "very commonly" obtained in the blood of 50 persons shortly after the epidemic. The cultures to which most ætiological importance was attached consisted of an organism belonging to a group of streptococci which was isolated 48 times from man or experimentally infected monkeys. These organisms which the authors call Group I. were characterised as highly pleomorphic, green-producing streptococci, which vary in their Gram-staining and fermentative properties, are not bile-soluble and are facultative anaerobes. These were not found normally in the blood or respiratory tract of monkeys. The streptococcus they consider similar to or identical with an organism described in an investigation of influenza in 1918–19 and more recent outbreaks. Other cultures, especially a group called Ia, appeared to have some relation to infections in man and animals, but were not so definitely associated with influenza.

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[1] Arch. f. Schiffs- u. Trop.-Hyg., November, 1929, p. 610.

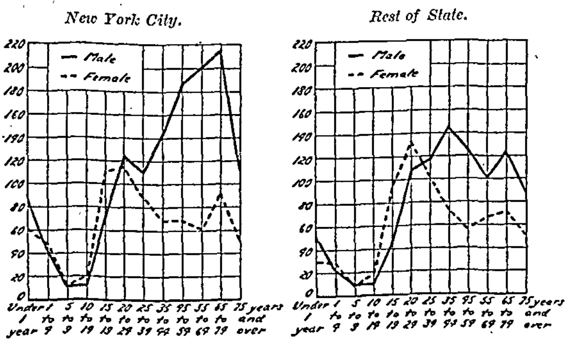
[2] Presse Méd., Jan. 4th, 1930, p. 21.

[3] Falk, I. S., Harrison, R. W., McKinney, R. A., and Stuppy, G. W.: Jour. Amer. Med. Assoc., Dec. 28th, 1929, p. 2030.

Making all allowances for the great bacteriological difficulties presented by the streptococcus group it does not seem certain from the evidence available that a definite streptococcus had a common primary ætiological relation to the cases of human influenza. There remain a number of points which need clearing up before it can be said that an epidemic of influenza was due to a well-defined species of streptococcus. The possibility that the initial infection was due to a virus does not appear to have been excluded, though such an infection is widely held to be the essential cause of influenza. That complications and pathological changes occurring in influenza epidemics are often due to infections with streptococci which invade a large number of closely associated cases is generally accepted, though attempts to establish this view have not often been so vigorously carried out and supported by experiments on monkeys. As was indicated in our annotation of Dec. 21st, 1929 (p. 1321), there are many difficulties in the way of accepting the work of Prof. Falk and his colleagues as having solved the whole problem of the ætiology of influenza. It is only fair, however, to add that such wide claims as were made in the lay press do not appear in the preliminary report. A full account of the investigation is promised shortly.

VITAL STATISTICS OF NEW YORK CITY.

THE records of life and death of the State of New York have become among the most important in the world, and the 49th annual report of the State Department of Health, dealing with experience in the year 1928, is an important volume, not only for the State itself, but as enabling comparisons with countries in the Old World to be made. We say, advisedly, comparisons with other countries, for the sovereign State of New York has a population of over 11½ millions. It is by far the most populous of the States of the Union. Of this population six millions live in the city of New York, the remainder in the many large towns and counties of the rest of the State. Both Dr. Matthias Nicoll, the State Commissioner of Health, and Dr. J. V. De Porte, the director of the division of Vital Statistics, can be congratulated on the increasing value of this report, and on the efforts being made to secure complete accuracy. In the past it has been difficult to be sure that comparisons between different towns and between rural and urban districts of the State were trustworthy, owing to the absence of a complete relegation of all deaths in outside institutions to the administrative districts in which the deceased had resided. Now tables are given enabling one to correct records by resident rates from all causes, for tuberculosis, cancer, and automobile accidents. A distinctive method is adopted for automobile accidents, which are corrected for place of occurrence of the accident. The allocation secured in these instances gets rid of a serious source of fallacy, while the second even more important source of fallacy, that of differing age-distribution of population, can be checked by the death-rates given in the report for separate age-groups. The importance of the correction is well seen in the statistics of tuberculosis. By allocation of deaths according to residence, the tuberculosis death-rate of New York City is increased by 11 per cent., and that of the rest of the State is reduced by 13 per cent. Similar allocation changes the fictitiously high death-rate of rural districts, which, instead of being 26 per cent. higher, become 35 per cent. lower than the urban rate.



Death-rates per 100,000 from tuberculosis (all forms) in 1928.

The difficulties must be very great, but we hope that it may soon become practicable to give for all the areas within the State a complete allocation of death, which will make the report even more valuable than at present, as a means of comparison, and as a stimulus to investigation and reform in the areas with less favourable statistics. Against diphtheria the State organisation has done remarkable work in the immunisation of young children. These efforts have been eminently successful in reducing diphtheria in the districts in which the campaign has secured widespread immunisation; but so far as the experience of the State as a whole is concerned, it may be noted that in 1928 the death-rate from diphtheria was 107 in New York City, and 39 in the rest of the State, as compared with 81 in England and Wales. The comparison thus made is, however, unfair to New York State, unless we bear in mind that over a series of years diphtheria is several times heavier as a cause of death in continental than it is in insular countries. Probably, therefore, the results just quoted imply that New York State is already reaping some of the good results attainable from its admirable work for immunisation of children.

One further point may be extracted from the report out of the many which deserve study. It illustrates a point already under investigation both in this country and in the States—namely, the excess of death-rate from tuberculosis in girls over boys at ages 1–4, 5–9, 10–14, and 15–19. At all other ages, after the age of 20 has been reached, the tuberculosis death-rate in both countries is markedly higher in males than in females. The accompanying graphs taken from p. 40 of the report, show the differences between the two sexes at each age-period separately for New York and for the rest of the State. It will be noted that the excess of female tuberculosis begins at the pre-school age and continues right up to the age of 20. It is not explicable, therefore, solely by the greater amount of industrial and office work of girls in recent years. This, indeed, would scarcely explain it, as lads are subjected to similar conditions. The greater amount of outdoor life of boys may partially explain the difference; but the period of such temporary service. Permanent commissions will normally be offered to temporary officers on or before the completion of 12 months of temporary service. Temporary officers who do not then accept a permanent commission will not be eligible, save in exceptional circumstances, for the grant of a permanent commission at a later date. An officer appointed to a permanent commission whilst serving as a temporary officer under the above conditions will not receive the bonus of £100 for each completed year of service, but he will be allowed to count such temporary service for increase of pay, promotion, and retirement. All particulars may be obtained by application to the Under Secretary of State, the War Office (A.M.D.1), Whitehall, London, S.W.1.

PASSIVE IMMUNITY IN CHICKEN-POX AND MEASLES.

In the case of measles passive immunisation by means of convalescent serum has passed from the experimental to the practical stage, as witness the scheme of prophylaxis lately recommended to boroughs by the Council of the Metropolitan Branch of the Society of Medical Officers of Health. It was inevitable that, sooner or later, the same procedure should be applied to other diseases of unknown ætiology, such as chicken-pox and mumps. The use of convalescent serum to secure a temporary protection against chicken-pox is said to have been tried first in 1923 by Blackfan, Peterson and Conroy,[1] and since then it has been studied in various quarters. The reasons for immunisation are not so urgent in chicken-pox as in measles, since it is not destructive to life and well-being. But, as J. E. Gordon and F. M. Meader,[2] point out, cross-infection with this disease is always upsetting the harmony of hospital management, because it requires three weeks' quarantine, and there is the " additional disagreeable criticism which follows contraction of a secondary infectious disease, even in the absence of culpability on the part of hospital personnel."

These writers submit some interesting evidence on the incubation period and the period of infectivity of chicken-pox. In 54 out of 67 cases in which the incubation period could be calculated with precision the eruption came out on the thirteenth to the seventeenth day, the commonest being the fifteenth, and in no instance did it appear on the generally accepted maximum of the twenty-first day. Two cases in their experience throw light on the infectivity of chicken-pox before the efflorescence of the eruption, and while one indicated that chicken-pox is not infectious 24 hours before the appearance of the rash, it appears from the other that the patient was infectious at least nine hours before vesicles were noted. Gordon and Meader consider that these features of chicken-pox have an important bearing on serum prophylaxis, because the long incubation period gives the antibodies a chance to catch up the slowly multiplying virus, while the parallelism between the first unmistakable sign of the disease and its infectivity make it possible to determine with some certainty the time of possible infection of susceptible contacts. Owing to the high infectivity of the prodromal stage of measles—a stage sometimes prolonged to five or six days—contacts may be infected some time before the infecting case is definitely recognised, and the benefit they will gain from convalescent serum is correspondingly reduced; since to produce complete protection against measles the serum should be given in the first five days of the incubation period. We doubt if this aspect of measles prevention work has been sufficiently recognised. Almost all the preliminary work has been done in hospitals where the early signs of the catarrhal stage are likely to be noted promptly, and now that the method is to be applied in the field of general practice, we must not be disappointed if the percentage of completely protected children is somewhat less high. Whatever importance is attributable to the factors mentioned, the success which Gordon and Meader report from using convalescent serum in prophylaxis against chicken-pox is encouraging, a protection rate of 91 per cent. being claimed among susceptibles. They got their best results by giving an intramuscular injection of 10 c.cm. of a pooled serum obtained from convalescent patients one to two months after the eruption. Serum obtained two to four months after the eruption was less reliable, whilst the protective value of serum withdrawn five to ten months after the onset was poor. To forestall the criticism that absence of infection is not always due to prophylactic measures, they have been careful to include in their observations 81 cases in which exposure took place but no serum was used. Fifty-five of these exposed susceptibles took chicken-pox, and it is on the basis of this proportion of infections that they have calculated their protection rates in the serum-injected patients. The serum being homologous, no objection can be raised on the ground of serum sickness or sensitisation of the patient. As with other forms of passive immunity, the duration of protection is relatively brief; apparently it does not last much beyond the longest incubation period, since of 12 injected patients re-exposed to secondary cases two contracted chicken-pox.

We are aware of several experiments in passive immunisation against chicken-pox having been carried out in this country, and it might be worth while to take these further. The current remedies for limiting ward outbreaks are the prompt isolation of cases and the quarantine of susceptibles, preferably in small groups. In view of the limited isolation accommodation in many of our fever and children's hospitals, the dispersal of a mass of contacts is often only a counsel of perfection, and whole wards have to be retained in quarantine for three or six weeks or even longer. In this way it is a recurrent experience to find as many as 10 per cent. of the available beds of a hospital in which the normal ebb and flow of admission and discharge is seriously interrupted. This can hardly be regarded as satisfactory, and it may well be that immunisation provides the best remedy.

MINOR LENTICULAR OPACITIES.

In Vol. XX. of the Westminster Hospital Reports Mr. A. F. MacCallan remarks that the slighter forms of cataract are much more common than is usually supposed and may be present even in persons with full visual acuity. It is, however, questionable whether in the interests of the peace of mind of our patients these slight forms of cataract, at any rate such as are non-progressive, ought ever to be termed cataract at all. The phrase " opacities of the lens " would be preferable. Mr. MacCallan describes several varieties of the condition, nearly all of which are in the lens cortex and therefore cannot have been present at birth, apart from certain rare forms of lamellar cataract developing earlier than usual in the layers now known as the " fœtal nucleus." All these forms of opacity, including the one just mentioned, presumably owe their origin to some variety of defective nutrition affecting the lens fibres which are being continually developed from fœtal life to old age. In the case of lamellar cataract we know that the defect in nutrition is one that is often associated with rickets and defective enamel of the incisor teeth. In the case of the cortical opacities of all degrees found in adult life. In Mr. MacCallan's opinion the cause in the majority of cases is a condition of chronic focal sepsis. The nutrition of the lens is derived by osmosis from the aqueous humour whose composition is dependent on that of the blood. There is experimental proof that certain poisons introduced into the blood can cause cataract. In rabbits artificial cataract has been produced by feeding them on naphthalene. Mr. MacCallan's experience in Egypt proved to him that the poison of ankylostomiasis is capable of causing cataract. Diabetic cataract must be caused in a similar way. His belief is that in almost all cases of cataract, and also of those slight lens opacities which may be compatible with good vision, some focus of toxic absorption either has existed or does exist, and that it is our duty to seek for it in the teeth, nasal sinuses, or mucous membrane, tonsils, intestinal tract, or elsewhere. In a series of his own cases, while not all those with focal sepsis exhibited lenticular opacity, every one where this was present was found to have a condition of focal sepsis. Since, in another passage, Mr. MacCallan tells us that in two series of his own cases as many as 45 per cent. were shown, either with or without the slit-lamp, to exhibit some opacity of the lens, his figures may be thought to prove too much for his argument to have much weight, for the connexion of two such very common conditions as focal infection, past or present, and slight lenticular opacities is by no means necessarily one of cause and effect. (The percentage of 45 given by the author seems higher than his figures justify.) The particular condition of sepsis that is by far the most common is dental sepsis, and since it is rare to find anyone in middle life who has not at some period suffered from dental sepsis it is difficult to see how percentages in this connexion can prove anything at all. At the same time it must be admitted that there is considerable ground, prima facie, for attributing many forms of cataract to sepsis, a view for which Mr. MacCallan does not claim any originality. The presence of opaque striæ in the lens is due, as a rule, to the coagulation of the protein substance of which its fibres are composed, but incipient cases may be due to the presence either within or between the fibres of a fluid of different refrangibility which has not actually coagulated. From the latter condition recovery may be possible. In the former the opacities are permanent, but they need not necessarily be progressive. In any case, therefore, it is well worth while to seek for any existing focus of septic infection, whether in the teeth or elsewhere.

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[1] Ohio State Med. Jour., 1923, xix., 97.

[2] Jour. Amer. Med. Assoc., Dec. 28th, 1929, p. 2013.

JAMES MACKENZIE INSTITUTE FOR CLINICAL RESEARCH.

IT *is now ten years since the late Sir James* Mackenzie founded at St. Andrews an institute with the main purpose of investigating the earliest symptoms of disease and the mechanism of their production. During its tenth year 150 new cases and 110 additional notes were added to the files, and 1271 specimens were examined in the laboratories. All the records have been reviewed and rendered as complete as possible, and the studies on the cytology of the blood were continued, as well as those on the ætiology of the common cold; the relation of respiratory catarrhs in young children to environmental conditions; the relation of the state of the tonsils to disease; and the variations in the temperature and pulse which are consistent with health, as distinguished from those which betray early signs of disease. New lines of investigation opened up during the year include an enquiry into the early manifestations of cancer, and a study of after-histories of patients with gastro-intestinal disorders, in an attempt to assess the prognostic value of radiological examination. The Public Health Department has succeeded in coördinating the work of the private and panel practitioner with that of the maternity and child welfare and school medical officers, and regards this administrative advance as one of first-class importance. Over 80 per cent. of all the children born in the burgh are supervised by the child welfare centre, the records of which include antenatal histories provided by the practitioners. The children are examined at regular intervals, however healthy they appear to be, and are observed continuously throughout their school years. In these ways the Institute is keeping alive the spirit of the great general practitioner and public health worker whose name it bears.

Sir Cuthbert Wallace has been appointed Director of Medical Services and Research to the Mount Vernon Hospital, Northwood, where the investigation of radium in the treatment of malignant disease is being actively pursued.

THE death occurred unexpectedly on Jan. 21st of Dr. Philip Boobbyer, who retired a year ago from the post of Medical Officer of Health of the City of Nottingham.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdr H. Hurst to be Surg. Comdr.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Lt. A. D. Bruford to be Lt.

Proby. Surg. Sub-Lts. to be Surg. Sub-Lts.: J. N. Matthews and W. J. Poole.

Proby. Surg. Lt. T. G. Evans to be Surg. Lt.

Proby. Surg. Sub-Lt. B. Blewitt to be Surg. Sub-Lt.

ROYAL ARMY MEDICAL CORPS.

The undermentioned Lts. (on prob.) from the secd. list are restd. to the estabt.: W. G. Harvey, D. A'Brook, and T. G. D. Coneys.

Lt. (on prob.) W. G. Harvey is confirmed in his rank.

Lt. F. H. A. L. Davidson relinquishes his temp. commn.

TERRITORIAL ARMY.

Second Lt. H. W. Davies, from 16th Lond. R., to be Lt.

INDIAN MEDICAL SERVICE.

The undermentioned officers retire: Col. J. N. Walker, Lt.-Col. H. A. Williams, and Maj. M. Prasad.

COLONIAL MEDICAL SERVICE.

The following appointments have been made: Miss J. G. E. F. Cummins, Medical Officer, Gold Coast; Mr. P. J. Cowin and Mr. E. O. W. Maxwell, Medical Officers, Kenya; Mr. W. McCoach, Pathologist, Nigeria; Mr. W. E. Thompson, Specialist Surgeon, Palestine; and Miss M. M. McDowall, Medical Officer, Sierra Leone.

INDEX TO "THE LANCET," VOL. II., 1929.

THE Index and Title-page to Vol. II., 1920, which was completed with the issue of Dec. 28th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

POST-GRADUATE LECTURES ON CANCER.—The second lecture arranged by the Clinical Medical Studies Committee of the University of Sheffield in conjunction with the Yorkshire Council of the British Empire Cancer Campaign will be given in the Physics Lecture Room of the University on Tuesday, Feb. 4th, at 8.45 P.M., by Sir Lenthal Cheatle, Surgeon and Lecturer in Surgery, at King's College Hospital, London. His subject will be the Treatment of Mammary Carcinoma by Radiation, and all qualified medical practitioners are invited. Dr. J. Murdoch, Chief of the Department of Radium and Radiotherapy at the Brugmann Hospital, Brussels, has promised to give the third lecture of this series at some date in May.

Special Articles.

A CLASSIFICATION OF BRIGHT'S DISEASE.

In a report[1] issued by the Medical Research Council Dr. Dorothy S. Russell gives a detailed account of the minute structure of the normal kidney and of the changes in its structural elements that accompany the various pathological states described. Dr. Russell has availed herself of the data accumulated by Prof. Turnbull in the Institute of Pathology at the London Hospital, and of the clinical opportunities in the wards. Her attempt has been to supply working principles to enable the practitioner to pass from ascertained facts to an interpretation of the underlying structural changes.

Under the term Bright's disease have been included two kinds of disturbance of renal structure which can, according to Dr. Russell, be differentiated with certainty by the microscope, and which are due to two distinct pathological processes. One of these is a slow infarction due to arterial degeneration: an ischæmic nephritis. The other is an inflammatory reaction to bacterial or other toxins: a toxic nephritis.

Ischæmic Nephritis.

This may occur independently of toxic nephritis, and has then been called primary ischæmic nephritis. A certain amount is found in the kidneys of most adults; unusual degrees at any age are due to exceptional arterial degeneration and are in consequence most commonly complications of cardiovascular disease. The gross appearances of the kidneys show variations depending upon the nature of the arteries which are partly occluded. Severe degrees of primary ischæmic nephritis appear to give rise to occasional slight albuminuria and to the passage of hyaline casts into the urine, but no evidence has been obtained of any other interference with renal function. Any alterations in renal efficiency have been fully explained by heart failure, which so frequently complicates cardiovascular hypertrophy.

Inasmuch as there is no evidence that the actual condition of the kidney ever gives rise to any illness, it is doubtful whether primary ischæmic nephritis should be included in Bright's disease. Primary ischæmic nephritis may be complicated by a secondary toxic nephritis, but it does not render the kidney liable to this complication. On the other hand, primary toxic nephritis, at any rate of the kind distinguished as acris, tends to be complicated in its later stages by cardiovascular hypertrophy, and consequent arterial degeneration and ischæmic nephritis. Such secondary ischæmic nephritis is very seldom absent from the chronic examples of toxic nephritis, and in the most chronic form of toxic nephritis disturbances of the cardiovascular system may dominate the symptoms.

Histologically such secondary ischæmic nephritis can be distinguished with certainty from the associated toxic changes.

Toxic Nephritis.

This can be divided histologically and clinically into two main kinds. In one kind parenchymatous degeneration is the chief renal change and the inflammatory reaction is of low grade. Lipoid is typically very abundant. This kind of nephritis corresponds to the nephrosis of Volhard and Fahr, and the lipoid nephrosis of Munk; it has been distinguished histologically here as nephritis mitis.

Nephritis Mitis.—Examples of this have been found in an early stage before granulation and in an intermediate stage of granulation, but not in a late or chronic stage of sclerosis. In only one example of nephritis mitis in the intermediate stage was cardiovascular hypertrophy found, and the degree of hypertrophy was slight. Clinically nephritis mitis causes grave œdema, but no appreciable disturbance of renal function as estimated by the excretion of urea and dye: it gives rise to a hydropigenous nephritis. The mildness of the exudative inflammation is reflected in the cytology of the urine. Clinically the disease has no acute stage, and no appreciable difference was detected between the clinical symptoms in the early and intermediate stages. Death in all cases was due to an intercurrent infection, usually with pneumococci. Histologically nephritis mitis resembles the forms of nephritis that are symptomatic of endogenous toxins. No clinical evidence was obtained of the cause.

Nephritis Acris.—The other kind of toxic nephritis is distinguished histologically by the higher grade of inflammatory reaction, and has been called nephritis acris. The clinical characteristic of this nephritis is interference with renal efficiency: it is an azotæmic nephritis. Histologically nephritis acris resembles the nephritis symptomatic of bacterial infection. Where evidence has been obtained of a cause in examples not obviously symptomatic, the cause has been a bacterial infection.

Nephritis Acris Proper.—Nephritis acris can be separated into two divisions. In one division, acris proper, the inflammation is initially widespread and rapidly involves the kidney by extension. Examples have been obtained in an early stage before the appearance of granulation, in a stage of granulation, and in a late or chronic stage of sclerosis. In the early stage the clinical symptoms are those of a typical "acute hæmorrhagic nephritis." Our material representing this stage was obtained in years before the biochemical tests of renal efficiency were instituted. There was, however, clinical evidence of severe renal disturbance. The intermediate stage may be preceded clinically by the early, but more often starts insidiously.

In the more intensely inflamed examples the symptoms in the intermediate stage resemble those observed in the early stage, and death is due to renal inefficiency after a relatively short history. In the less intensely inflamed examples in the intermediate stage lipoid may be as abundant in the kidneys as in nephritis mitis. An insidious onset and the development of gross œdema are characteristic clinical features. Symptoms of renal inefficiency are present, but are seldom so striking as in the more intense type. The late stage is found on histological examination to follow only the less intense inflammation found among examples in the intermediate stage. Clinically it follows the milder illnesses of the intermediate stage or begins still more insidiously. In this late stage it is an azotæmic nephritis, accompanied or preceded by œdema. Cardiovascular hypertrophy, arterial degeneration, and consequent ischæmic nephritis make their appearance in the intermediate stage, almost without exception towards its close, and become more prominent and constant in the late stage.

Nephritis Repens.—The other division of nephritis acris is characterised histologically by the relatively focal nature of the initial inflammation and the slowness of its extension. No specimen of this condition has been found in the stages preceding sclerosis. Histologically the division has been separated into four types, which differ chiefly in diminishing degrees of intensity of inflammation and increasing slowness of extension of inflammation. These types have been distinguished more as a guide for future investigation than as a final classification. Taken as a whole this kind of nephritis is sometimes preceded at a long interval of time by an attack similar to that of the early stage of nephritis acris, but usually the terminal stage of uræmia is preceded by only trivial symptoms. With the exception of type (3), in which children and young adults are affected and renal regeneration is maximal, cardiovascular hypertrophy and consequent ischæmic nephritis are prominent features and are greatest in the most chronic type.

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[1] Special Report Series. No. 142. H.M. Stat. Office. Pp. 248 and 16 plates. 8s. 6d.

Histological and Clinical Nomenclatures.

Alternative histological and clinical nomenclatures have been suggested for the various forms of nephritis described.

Histological.	*Clinical.*
1. Pure or primary ischæmic nephritis.	Primary arterio-sclerotic nephritis.
2. Toxic nephritis.	
(1) Nephritis mitis in—	
early stage. intermediate stage.	Subacute hydropigenous nephritis.
(2) Nephritis acris in—	
early stage.	Acute nephritis.
intermediate stage.	Subacute azotæmic nephritis.
chronic stage.	Chronic ,, ,,
(3) Nephritis repens.	Insidious chronic azotæmic nephritis.

Macroscopic Appearances.

The macroscopic appearances in Bright's disease are usually not only unsafe as a guide to the underlying pathological changes in the kidney, but may even be misleading: thus, a "large white" kidney may either be an example of nephritis mitis or of the less intense type (3) of nephritis acris in the intermediate stage, and a "red granular" kidney may be an example of primary ischæmic nephritis or of the most chronic type of nephritis repens.

Distribution of Lipoid.

Considerable attention has been paid to the occurrence, amount, and distribution of lipoid in the kidney in all the different types studied, because so much prominence has been given to this histological feature in other classifications of Bright's disease. It has, in particular, been so linked up with the "nephrosis" of Volhard and Fahr and the "lipoid nephrosis" of Munk, that the occurrence of large amounts in the kidney or urine has come to be regarded as diagnostic of this mild form of nephritis. It is evident, however, from our investigation that such an attitude is most misleading. Large amounts of lipoid are present not only in nephritis mitis but in many examples of nephritis acris in the intermediate and late stages, and in some specimens of nephritis repens. Moreover, a variable amount of lipoid has been constantly found in all types of nephritis acris and nephritis repens, with the exception of a few examples of nephritis acris in the early stage and a few examples of the most chronic type of nephritis repens. It is obvious, therefore, that there is no definite association between the occurrence of lipoid and any specified type of inflammatory reaction in the kidney, nor can the presence of large amounts of lipoid in the kidney be the explanation of the clinical peculiarities of nephritis mitis.

Tests of Renal Efficiency.

In view of recent statements to the contrary (Beaumont and Dodds, 1925) Dr. Russell points out the usefulness of the routine tests of renal efficiency that have been employed in this investigation. These tests do not give a ready-made diagnosis, but serve as a valuable accessory to clinical observations. The discretion needed in their interpretation is illustrated by a list of extrarenal factors that can produce modifications of the results, and additions to this list will probably be made in the course of time. In Bright's disease the tests are of great help. They appear to be essential in distinguishing between nephritis mitis and the less intense type of nephritis acris in the intermediate stage.

Their second great point of application is in the separation of primary ischæmic nephritis associated with cardiovascular hypertrophy (clinical hyperpiesia), from the type of nephritis repens that is characterised by maximal cardiovascular hypertrophy. In ischæmic nephritis there is no impairment of renal function, whilst most examples of nephritis repens are seen first in the final stage of the disease when renal function is definitely impaired. The degree of impairment as estimated biochemically runs parallel with the amount of destruction found microscopically. But during the earlier stages of this type of nephritis repens that precede renal failure it has been seen that the focal nature and slow progress of the destructive processes in the kidney are compatible with normal renal function as judged by the routine tests. Hence the separation of primary ischæmic nephritis from this type of nephritis repens in the latent stage cannot be achieved by renal efficiency tests alone. Further work is needed to determine what other clinical criteria, if any, can be used in elucidation of this difficult problem.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Psittacosis in Germany.

A PECULIAR disease has lately been observed in families which have newly purchased parrots. The usual symptoms have been high fever with unconsciousness, followed by a pneumonia which is peculiar in that discharge from the lungs is very small and the lesions spread in foci. Cardiac weakness appears early. The birds bought by the patients came from Brazil on a Hamburg steamer *Arcona*, and it is said that cases of infection by parrots have recently been reported in that country. Bacteriological research has shown that the disease is psittacosis, which has hitherto been almost unknown in Berlin. Anxiety has been aroused among the general public, and various kinds of illness in households where there are parrots have been ascribed to these unfortunate creatures. The Berlin Health Department, however, has stated that this nervousness is unfounded, since parrots which have not been recently purchased are harmless, and only those which have just come from Brazil need be regarded as suspect. None the less the Department condemns the custom of letting parrots peck sugar or other sweets from the lips of their owners. It is said that in the Zoological Gardens, where hundreds of parrots arrive every year from abroad, there has never been a case of psittacosis—probably because the Department insists on a control of zoological stores dealing with the sale of parrots and on a disinfection of the cages. At the present time parrots are being taken in large numbers to the veterinary college and to private veterinarians for examination, but so far only a few have been found ill. Among human beings there have been six deaths in Berlin, and also one death at Altona, which is beside Hamburg. The nurse and the doctor in charge of the dead patient in the hospital also caught the disease, but have recovered.

Measles in a Concentration Camp.

German peasants who were emigrating from Soviet Russia to settle in Canada were housed while passing through Germany in a concentration camp at Hammerstein in East Prussia. Already during their journey through Russia several infants had died, and in the camp a severe epidemic broke out affecting 192 children with 52 deaths. The nature of the epidemic was at first not quite clear, but it was soon ascertained that the disease was a severe form of measles with symptoms of septicæmia. A Government commission, including Prof. Friedemann, head of the department for infectious diseases of the Virchow Hospital in Berlin, was sent to the camp and reported that the disease had run an uncommonly severe course. This was due to the fact that the general state of the emigrants, and especially of the children, was very bad. They were underfed from the beginning, having received during their journey only bad bread, coffee, and tea; and the exertion of the long journey from Moscow to the frontier had made their state still worse. Similar cases had been seen, Prof. Friedemann said, during the late war, when the condition of children was rather like that of the emigrants. By order of the Government the Hammerstein camp was put under quarantine. Children received a diet rich in vitamins, and prophylactic

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

A SURVEY OF 1928.

WE have had the opportunity of summarising reports dealing with a great part of the population of Great Britain, and it may not be without interest to consider what evidence of progress in public health matters is to be gleaned from them. The year 1928, it may be noted in passing, was sunnier than its predecessor.

General Sanitary Measures.

Housing.—In most districts fewer new houses were erected, and there are signs that the demand for houses from families who can pay a reasonable rental is being gradually overtaken. A few districts are now beginning to take up slum clearance, but the new houses built are beyond the reach of the very poor. Amongst efforts to cater for the latter class Glasgow is to endeavour to provide an all-in 10*s.* house; and Stafford has earmarked 40 houses with three bedrooms on the municipal estate to be let to necessitous applicants at 9*s.* weekly including rates. Voluntary housing associations are taking a hand. A Lincoln society aims at providing 100 houses at 6*s.* 6*d.* per week (inclusive), and a York society at purchasing existing houses, renovating them, and letting them at weekly rentals from 3*s.* 6*d.* to 6*s.* 6*d.*, with Octavia Hill management. Perhaps the Cambridge society's contribution is the most noteworthy as it has actually provided 45 houses at rentals of 6*s.* 6*d.* (exclusive of rates) with a reduction of 6*d.* per week for each child of school age down to a minimum of 5*s.* Sheffield Corporation have set aside a number of houses for families which include an open case of tuberculosis. Other suggestions are the reconditioning of existing houses in order to provide accommodation for poor tenants evicted by slum clearance schemes, and national legislation for the prevention of the exorbitant rentals often demanded for houses-let-in-lodgings. Many medical officers speak approvingly of the Housing (Rural Workers) Act 1926, but as yet very little use has been made of its provisions.

Smoke Prevention.—The control of domestic smoke appears to be reaching a more practical stage. Several reports refer to the much more tarry deposit in residential than in industrial areas, owing to the less perfect combustion of the coal in domestic grates, and a much greater interest is being aroused in the production of smokeless fuel. It is even suggested that we are nearing the time when the burning of raw coal in the domestic grate will be prohibited. As regards industrial smoke, the new method of raising steam by the use of pulverised coal has evidently not been perfected yet, as several districts complain of the resulting nuisance from the emission of grit.

Rivers Pollution.—After the war many sewage disposal works suffered from the need for economy, but there are now signs of a greater desire to improve the condition of our rivers. More research is needed as to the best way of dealing with wastes from collieries, artificial silk, and beet sugar factories. On the other hand, it is now realised that the attempt to keep trade wastes out of the sewers has been in the past carried too far.

The *Health Education* of the public has received much more attention than in previous years. The circulation of the journal *Better Health* has now reached 268,000.

Food- and Water-supply.

Milk.—Better methods of milk production have been promoted by an increasing number of clean milk competitions and demonstrations in many counties, and more satisfactory premises are being provided under the Milk and Dairies Order, 1926. Systematic veterinary inspection of dairy cattle is a plant of slow growth, and in this matter the English counties lag behind the Scottish, but among the more populous counties Surrey has begun quarterly inspection, and Durham is making preparations for doing so. In many districts the percentage of tuberculous milk samples showed an increase in 1928, and there is no evidence that cows with udders affected and other signs of tuberculosis are being weeded out from dairy herds or notified by farmers at an early stage of the disease. The investigation of "outside" complaints of tuberculous milk has frequently ended in failure to trace the offending cow. The bulking of the milk from several farms at depôts in some cases increases the difficulties of these investigations. Several reports show that it is no easy matter to maintain a tested herd tubercle-free, and the county veterinary inspectors of Dumfries advocate double fencing and also the temporary segregation of new purchases to allow time for a possible incubation stage to elapse. In Scotland, too, we believe the risk of grazing tested herds on pastures which have been used by untested stock has been pointed out. The available quantity of graded milks has shown no rapid increase, and from several districts objections have come to the misleading designations at present adopted. Grade A is said to be regarded by the public as the highest quality of milk. Certified milk is usually about twice the price of ordinary milk, so perhaps it is hardly surprising to learn that the supply of this milk in the County of Dumfries already exceeds the demand. Apart from the London paratyphoid outbreak, considered to be due to infected cream, milk-borne infectious disease appears to have been less than usual in 1928, but a few small outbreaks of scarlet fever and diphtheria were traced to this source.

Water.—Most counties reported inadequate water-supplies in their rural parishes, and this creates especial difficulty in dairying counties. Even when we have obtained a national allocation of the available water, it will be difficult to provide a proper supply for many parishes at a reasonable cost.

Meat.—The new abattoir at Liverpool was begun during the year, and Coventry has obtained an ideal site for the same purpose. The improvement of imported meat will no doubt be promoted by the visit to the Colonies and the U.S.A. of the chief veterinary inspector of the City of London as the result of an invitation from the Governments of Australia and New Zealand.

Infectious Diseases.

Small-pox has been prevalent in many districts. In a large proportion of cases the introduction of the infection has been due to tramps. Few deaths were reported and the mild type is still breeding true.

Measles was epidemic in many districts, including London, during the year. The policy has been adopted in many districts of giving measles the preference over scarlet fever for hospital admission.

The use of antitoxin for *scarlet fever* is reported upon favourably, and several isolation hospitals claim to be discharging scarlet fever cases after 28 days without harmful results. In the Leicester hospital it is claimed that even better results are obtained by giving the antitoxin intravenously instead of intramuscularly.

There have been fewer cases of *encephalitis lethargica* notified, but the case fatality has been higher in many districts, and the unsolved problem of providing for the damaged survivors is referred to by many medical officers.

Glasgow had its first epidemic of *acute poliomyelitis* during the year. The acute cases coming to the knowledge of the health department numbered 112, mostly during July to October. This epidemic preceded the arrival of *influenza* (which was not prevalent in this country in 1928) from America during the early months of 1929.

The provision of hospital treatment for *pneumonia* is being urged more and more.

A few cases of *anthrax* have been reported, usually contracted from handling foreign hides, and Liverpool has put on record a series of cases successfully treated with serum without the excision of the malignant pustule.

Reports of *dysentery* came from Aberdeen, Manchester, Birmingham, Newcastle, and Staffordshire, and the suggestion is made that if the necessary bacterial examinations are made, it may be found that this disease is much more common in this country than has been hitherto thought.

Immunisation schemes against *diphtheria* continue to grow in number, and non-immunised isolation hospital staffs will soon be an exception. From most districts come complaints of delay in giving antitoxin, frequently because medical aid was not sent for sufficiently early.

A case of *undulant fever* was reported from Cardiff, and the subsequent discovery of *Brucella abortus* in several milk samples has raised the point as to whether milk-borne undulant fever may not be commoner than generally supposed.

Mosquito control is receiving more attention, and from Walton-on-Naze, Essex, came reports of a few cases of indigenous malaria, associated with the discovery of anopheline mosquitoes and the presence of ex-malarial subjects.

Maternity and Child Welfare.

The demand for more institutional lying-in accommodation is being gradually met and antenatal clinics are being established in connexion with all new maternity hospitals and homes. It is being realised that such clinics must be conducted by obstetricians. During 1928 an increase was recorded in the maternal mortality from sepsis in several districts. In some cases the appointed consultant obstetrician is being asked to investigate the cases of puerperal sepsis and the deaths from childbirth for the Ministry. A uniform international method of classifying maternal deaths in connexion with childbearing is much needed. Infant mortality is fast becoming a problem of early deaths from prematurity, &c., and of later deaths from respiratory diseases associated with measles and whooping-cough. The statistics we have given show that the chance for the young child (1 to 5 years) varies even more with the locality than infant mortality. Since the immediate after-effect of the war the birth-rate has not varied materially from year to year, so that the number of deaths in a locality at the age-period 1 to 5 per thousand births of the same year is a sufficiently reliable index of young child mortality. According to this index the young child mortality in 1928 was four times as heavy in Glasgow as in Leicester, and more than twice as heavy in the counties of Durham and Fife than it was in the counties of Somerset, Norfolk, Hampshire, and Northamptonshire. These are merely a few examples taken from our tables. Though opinions varied, there were many favourable verdicts as to the benefits derived from artificial light out-patient clinics, and frequently it was mentioned that the mothers who bring their children are favourably impressed by the results.

Other Municipal Schemes.

Tuberculosis schemes were hampered by the failure to secure early notification. Artificial pneumothorax is being more and more used in suitable cases by tuberculosis officers. As regards V.D. schemes, the percentage of default continued high. Many districts reported a rise in new cases, especially gonorrhœa, but it would be difficult to say whether this increase was due to a rise in incidence or to greater confidence in the treatment offered. On April 30th another rheumatism supervisory scheme was initiated—namely, at Croydon—with full coöperation of parents and teachers, but without provision for institutional treatment. It is much to be hoped that some provincial county borough will put in hand a complete scheme with provision for short stay and long stay cases in order that the possibility of preventing relapses and cardiac complications may be tried out.

MENTAL HOSPITAL REPORTS.

THE *East Sussex Mental Hospital* at *Hellingly* has published its report for 1928. On Jan. 1st, 1929, there were 1261 patients in the hospital. The recovery-rate for the year was 31·22 per cent., a lower figure than that for the preceding year on account of the unfavourable prognosis in a large proportion of new cases admitted. The death-rate was 6·82 per cent. There was a slight outbreak of influenza in March, and a rather more serious outbreak of scarlet fever in the autumn. The visiting surgeon performed 14 major operations, all of which were successful. The dental surgeon and the ophthalmic surgeon attended regularly, and submit special reports. They investigate thoroughly the teeth and eyes of all new patients, who receive also a searching physical examination supplemented by laboratory tests on the blood and urine. Parole was extended during the year, and at the end of it 55 men and 153 women were free within the grounds. Of the patients discharged 54 were first sent out on trial, 28 of them with a money allowance. The Swedish drill classes were again found to be of great benefit to the patients. A full account is given of the malarial treatment of 17 general paralytics. The results were not so good as in 1927. There is no organised occupational therapy, but about 14,000 new articles were made in the work-room during the year. The pathologist, in addition to carrying out the routine work of the institution—about 2000 tests of various kinds—also tests suspected tuberculous milk or organs for the public health authority. He has also found time for research into methods of analysis and into the causes and effects of mental disease. The urochromogen reaction has been found unreliable, but the complement-fixation test, elaborated on the lines of the Medical Research Council's No. 3 method, has proved very valuable. The Kahn test has been found less reliable than the Wassermann. The intestinal flora of patients has been studied and found abnormal in more than 80 per cent. Renal efficiency of general paralytics has also been investigated, and the malarial treatment has been found to throw a distinct strain on the kidneys and liver. The pathologist believes that more deaths of mental patients are due to renal poisoning than is commonly believed, and proposes to investigate this factor. The medical superintendent conducts a weekly clinic at the Princess Alice Hospital, Eastbourne. The shortage of female staff caused considerable anxiety. A social club for them has been organised, and everything possible has been done to improve their status. Three male and seven female nurses obtained their R.M.P.A. certificate during the year.

The report of the *Stirling District Mental Hospital* for the year ending May 15th, 1929, also appears somewhat belatedly. At the end of the year there were 964 patients on the register, 300 having been admitted during the year—a record number. In addition there were 24 voluntary patients. This increase put a heavy strain on the accommodation, which is unfortunately still burdened by a large number of mental defectives. The directors of the Stirling Royal Infirmary have asked the superintendent of the Mental Hospital to act as honorary visiting consultant to their new out-patient department for mental and nervous ailments. They have thus set an example to other provincial hospitals of Scotland. The recovery-rate in the institution was 37·44 per cent., and the death-rate 12·1 per cent. Autopsies were held in every case where permission could be obtained. There was an outbreak of influenza in the spring, but otherwise the general health was satisfactory. Modern methods of electrical treatment were applied to 135 patients, and the X ray apparatus was used for diagnosis in 22 cases. The dental surgeon visited weekly. An occupational instructress has been appointed and patients who cannot be occupied in any other way are taught rug-making, basket-, raffia-, and leather-work. The farm and gardens provided employment for about 200 male patients, and recorded a very good year. Nine nurses and four attendants obtained the R.M.P.A. certificate.

plants possess *the essential characteristic* of a living organism—namely, its power to grow and multiply (as Boycott himself agrees, p. 18); in other words, a living thing can produce more of itself by the incorporation and assimilation of less complex organic materials (food), using these to build up its own substance, this increase being followed in due course by division. In a living cell, there are plenty of dead things—inclusions, secretions, excretions, and the like; but these are all as dead as door-nails, so far as their power to increase independently of the living cell is concerned. Further, if, as Boycott admits may be the case, these invisible viruses are derived from ordinary living cells, that very fact would render it highly improbable that they themselves are distinct living entities. In any particular living thing, whether one of the lowliest cell-units, such as a bacterium, or a highly differentiated one, a congeries of which make up the body of a multicellular animal, we have not *the slightest evidence* that, in such a unit, there are contained lesser or simpler elements which subscribe to the definition of life. Indeed, apart from this, one has—a biologist particularly—an instinctive questioning, quite reasonable, as Boycott himself allows, whether it is possible for such minute particles as these invisible alleged organisms to be of sufficient size to contain the large aggregation of coördinated molecules necessary to constitute a unit able to exercise the wonderful functions of life. The *reductio ad absurdum* to which this "parasitic" view—as, essentially, it would be—would lead us is well shown by a consideration of Gye's theory about cancer, which implies that nearly all the cells of our body contain, normally, the invisible cancer-organism, a "foreign," intracellular, living element, which is only biding its time until the stimulation of some auxetic or adjuvant wakes it into activity! Even Boycott thinks this is an extremely unlikely idea.

And Boycott's own explanation is, I am afraid, equally improbable. The pity of it is that he does not see where many of his thoughtful and reasonable inferences inevitably lead! In these admittedly difficult cases, where we are dealing with minute quantities of substances which we cannot see, it is pertinent to bear in mind one of the essential postulates in connexion with the *vera causa* of the old logicians. Is the explanation reasonable, is it likely?

Now it so happens that I myself have devoted a considerable amount of research to this question and have come to the conclusion that the virus-diseases, and also malignant growths, are caused by non-living agents of the nature of ferments or enzymes, produced by the cells. As a matter of fact, I was the first to suggest this view and to bring forward, during a period of over five years, many observations and sustained arguments in favour of a comprehensive theory in explanation of the same. From the very first (1921) my view, in so far as the question of the transmissible property of the virus-diseases is concerned, was rendered, in my opinion, logically tenable by the very case which Boycott himself cites—namely, that of the bacteriophage of Twort-d'Herelle, which I regarded as an entirely comparable phenomenon. With regard to this, also, Boycott adopts a somewhat non-committal attitude. He merely says:

> "There are reasons for supposing that this agent arises in the bacteria themselves; . . . but the data are not conclusively against d'Herelle's view that it is really an independent parasite."

I believe the great majority of bacteriologists are agreed that this agent is a lytic ferment—even although this is not conclusively proved. In the case of virus-diseases, my theory assumes that the character of the normal blood-digestive enzyme has been altered by reason of the faulty vital activity of the cell, this pathological derangement having been induced at the outset by the infection with the virus—i.e., that particular modification of the normal enzyme in question. And it is very gratifying to see how Boycott is led to inferences which I have already drawn in certain of my papers. For instance, when considering the possibility that "fresh" virus may be made by each infected person or animal, he says that it is just possible that such diseases (he instances measles or distemper) were originally brought into existence by causes quite different from those which now maintain them. Similarly, I consider that these viruses have probably originated autogenetically, the pathological hæmetaboly having been induced in the first place by some outside cause, such as, in some cases, a very unusual manifestation or syndrome associated with an ordinary bacterial infection.[1] I may just mention two interesting possible examples, in a transitional phase, as it were, that is, developing at the present time, though these are still admittedly little more than speculations or notions, as Boycott puts it. They are encephalitis lethargica, and the virulent, devastating type of influenza; but here, too, lack of space precludes any consideration of them. Again, Boycott admits that if these viruses are the product of abnormal cell-activity, having once arisen, it is by no means impossible that some can arise *de novo*, nowadays, given the necessary conditions. (This is a very different thing, it must be borne in mind, from the creation of a new living organism, apart from an existing one!) And, indeed, as regards at least one type of stabilised, regular virus (if I may so put it), namely, typhus and its congener, trench-fever, the fresh origin of such virus by pathological hæmetaboly in its primary host, the louse, is, I venture to say, very much more than a mere possibility.

Just because it is so apparent from Boycott's article that the only alternative to a causal organism in the case of the virus-diseases and of cancer is a ferment, and because I was the first to put forward this view, as a result of my own work on the important function of normal blood-digestion and its various derangements, I have thought it worth while to trespass on your space.

I am, Sir, yours faithfully,

H. M. WOODCOCK.

Walton-on-Thames, Jan. 14th, 1930.

TESTS FOR MOTOR-DRIVERS.

To the Editor of THE LANCET.

SIR,—It is surely essential that a motor-driver should not be given a licence to drive till he has furnished a certificate that he is free from such a grave disability as to render him totally unfit to be a chauffeur. There are many men with very defective vision in one eye or partially deaf who are unaware of the fact, and many others who will not admit the defect.

The Road Traffic Bill, as amended in Committee (Clause 5, p. 6), accepts the applicant's *declaration* as to freedom from disability. In the interests of humanity, and for the safety of the public, I suggest that some *test* (neither severe nor expensive) should be insisted on for every applicant for a licence to drive a motor. A simple form might be filled in and signed by a doctor at a modified fee, paid by the applicant. The amount of the fee might be settled by the State. A re-examination and certificate need not be annual.

As one of the delegates I raised this point at the Conference on Street Accidents, convened by the Minister of Transport on Jan. 14th and 15th, which was supported by Mr. A. Hume Nicholl, Chairman of the London "Safety First" Council. The only arguments advanced against a test were on the score of expense and impracticability.

I am, Sir, yours faithfully,

D. A. COLES,

Chairman of Council of Industrial Medicine; Vice-Chairman of London "Safety First" Council.

Beckton-gardens, E., Jan. 17th, 1930.

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[1] And, ultimately, it should be added, cellular autolysis, which is probably, in most cases, the end-result as regards the affected cells.

MUTILATING OPERATIONS.

To the Editor of THE LANCET.

SIR,—Having witnessed the circumcision of an infant of humble Jewish parentage many years since, the correspondence under the above title has interested me. In order to ascertain the details of the present manner in which the rite of circumcision is performed, I consulted a high authority on the subject, and his description, which I now quote, differs only from that at which I was present in the absence of antiseptic measures.

"The rite is not performed by a priest; the official is called the mohel, and he is always licensed by the Jewish authorities. It is always a particular kind of surgical knife which is used and is very sharp. The mohel with the wine in his mouth exerts suction when he takes the penis into his mouth; this is to draw blood, and it is usually done several times. But the actual stopping of the bleeding is by means of some astringent powder, or this mixture: sulphuric acid, 1 part; alcohol, 3 parts; honey, 2 parts; vinegar, 6 parts. The mohel is supposed to wash his hands in a solution of bichloride of mercury beforehand."

My friend states in a postscript: "Scriptural sanction exists for the rite only; its performance, —i.e., the details—is not mentioned; they have been gradually adopted."

I am, Sir, yours faithfully,
CHARLES W. CHAPMAN.
Wimpole-street, W., Jan. 16th, 1930.

COMPULSORY TREATMENT OF VENEREAL DISEASE.

To the Editor of THE LANCET.

SIR,—On behalf of the Executive Committee of the British Social Hygiene Council I should like to make clear the position of the Council in regard to the question of compulsory treatment of venereal disease, as certain of the remarks made by Dr. Sequeira in his letter published in your issue of Jan. 18th may give rise to misunderstanding. The Council holds no brief either for or against compulsory treatment of venereal disease. At its meeting on June 13th, 1923, it accepted the report of the Committee of Inquiry on Venereal Disease presided over by Lord Trevethin "as a document that can bring together all persons of goodwill in efforts to reduce venereal diseases." The report contains the following references to venereal disease:—

"We think that in the present state of public opinion any system of general compulsory notification of venereal disease would tend to concealment, and would prove a backward step."

"Notwithstanding what we have said above we are of opinion that it may well be that in certain areas special measures for the prevention of venereal disease would be justifiable, for example, measures for dealing with defaulters ....and we think that local health authorities who are able to make to the Ministry of Health a special case for some such special measure should be allowed, at any rate for some limited period, by way of experiment to carry out the measures they propose under the present system by which a contribution towards the expenses is made by the State. In this way there may ultimately be built up a body of experience of great value in determining future policy."

The position adopted by the Council was reaffirmed in the following resolutions passed at the meeting of Council held on July 5th, 1928:—

"The Executive Committee have received the information as to the Edinburgh Corporation Provisional Order, and in their view it comes under the conditions for experimental areas as suggested in the report of the Trevethin Committee, and in that sense they propose to watch the experiment with care, and do not propose to take any action";

and at the meeting of the Executive Committee held on December 2nd, 1929:—

"The Executive Committee recommend that in pursuance of the decision previously taken upon the Trevethin report, the Council should take note of the possible action of the Scottish local authorities in seeking additional powers for the treatment of venereal diseases, such powers to be for a limited time, and of an experimental nature."

I am, Sir, yours faithfully,
E. O. GRANT,
Secretary, British Social Hygiene Council.
Carteret House, Carteret-street, S.W., Jan. 21st, 1930.

THE FIRST ASYLUMS RESEARCH LABORATORY.

To the Editor of THE LANCET.

SIR,—With reference to the statement made by your Scottish correspondent in your issue of Dec. 14th, 1929, and Dr. Douglas McRae's support thereof, and with every respect and admiration for the Scottish effort in 1898, the claim to be first in the field cannot be sustained. The research laboratories of the London County Mental Hospitals, subserving the purposes of nine mental hospitals, accommodating 16,000 patients, came into existence in 1895.

I am, Sir, yours faithfully,
JOHN R. LORD,
Editor, "Mott Memorial Volume."
Epsom, Surrey, Jan. 20th, 1930.

To the Editor of THE LANCET.

SIR,—An annotation in your issue of Jan. 18th, entitled the First Asylums Research Laboratory, claims this title for the laboratory opened in Edinburgh in 1898. It may be of interest to point out that the Central Pathological Laboratory of the London County Council Mental Hospitals Department was established under the directorship of the late Sir Frederick Mott in 1895. It owed its inception to the report of a medical subcommittee of the London County Council, made in 1893, whose recommendation for the appointment of one pathologist of standing and position for the London Mental Hospital Service found a very vigorous advocate in Sir William J. Collins, the chairman of the subcommittee. It was decided to establish a central laboratory and museum at Claybury Mental Hospital, at that time only just finished. It was not until 1916 that the laboratory was removed from Claybury to the Maudsley Hospital. A member of the original staff recruited by Sir Frederick Mott in 1895, Mr. C. Geary, is still working in the laboratory.

I am, Sir, yours faithfully,
F. GOLLA,
Director, London County Council Mental Hospitals
Department, Central Pathological Laboratory.
Denmark Hill, S.E., Jan. 21st, 1930.

THE LATE SCARE IN BRIGHTON.

To the Editor of THE LANCET.

SIR,—I think it should be known among gentlemen of the medical profession who often send their patients here that there have been no further cases of illness in Brighton and Hove as a result of what has been called the "sore-throat scare." I have the personal assurance of the Medical Officers of Health concerned, Dr. A. Griffith, of Hove, and Dr. Rutherford Cramp, that no cases have come under their notice since the end of last year. The cause, as you may know, was traced to a certain milk-supply in a particular part of the county, which was fortunately traced to its source, the supplies stopped, and the danger removed. In no case, so far as it was possible to ascertain, was there any illness in the hotels, and this at a time when they were full to overflowing on account of the Christmas holidays.

I am, Sir, yours faithfully,
FRANK EVANS,
Chairman, Brighton and Hove Hotels and
Restaurants Association.
Jan. 21st, 1930.

glass—have shown in recent times not only that cells from the connective tissue may turn into blood corpuscles or migrating cells, but that real blood corpuscles, circulating in the blood, may migrate into the connective tissue and become connective tissue cells, real fibroblasts, builders of the connective tissue, and even fat cells, that help to build up the tissues of the body and to store up its energy. To my mind there is nothing so illustrative of the harmony of the body and the dominance of the organism as a whole over the cellular units as this interchange of functions this "interpenetration of all by all," which occurs wherever it is needed to maintain and secure the normal healthy state of all its parts. It is always the connective tissue—penetrating the whole body, carrying the nourishing blood-vessels, the lymphatics and the nerves, securing and guiding the chemical processes of the different organs, forming the supporting tissues (bone, cartilage, sinews, and ligaments)—which plays such a prominent part in this harmony of the organism and tries to secure it by constant efforts to adapt to the ever-changing environment.

The Problems of Senescence.

The problem of senescence is closely allied to the problem of growth. Why do we get old? Why has every animal a definite duration of life, varying little in a given species but extraordinarily different in different forms? Why is man among mammals distinguished by his extraordinary longevity, but why, after all, do we die? Of death we know nothing. We see it everywhere around is, but we do not know what it is, any more than we know what life is. Let us simply define death as the irretrievable loss of life and the definite change of the body into a corpse. Then we may say that for every living organism, for every plant and every animal, the price of life is death at the end. Of course we speak here only of natural death. When a body is crushed, burnt, or drowned, we are quite easily convinced that death follows, but even when we can exclude violent accidental death we see at the close of life that the energies become less and less, old age sets in, the movements become less frequent and less energetic, atrophy begins, and death is the end. "Natural death"—viz., the termination of existence due to uniform senescent atrophy of all the structures of the organism, leading to a uniform depression and ultimately to a simultaneous extinction of all the functions, is probably very rare. In actuality death is always in some measure accidental. An aged individual contracts pneumonia and succumbs to its effects, or a cerebral vessel is ruptured, or some other misfortune occurs as the result of a chance encounter. The same encounter, however, may have occurred repeatedly in the life of the individual without his ever having been conscious even of indisposition. Why has the final encounter a different issue? Simply because the underlying senescence of his tissues has rendered them more vulnerable. So, after all, death is the end of this general senescence of the tissues, and the real question we have to answer is why do we get old, and what is senescence?

Senescence is in the first place a general change of the body, not of a single tissue. The very old grow shorter in stature. At the age of 40 this diminution in height is already beginning, at 70 the average height has shrunk from 175 cm. to 160 cm. This decrease in stature is largely due to changes in the vertebral column, to stoop and to changes in the tissues. The roundness of youth has departed, the cheeks are sunken, the eyes have fallen far back, and the lips are drawn in. There is an atrophy of the tissues, especially of the connective tissues. The gait becomes shuffling, the old man drags himself cumbrously along; the power of his muscles and his control over the action of these muscles is lessened; there is an inferior coördination of his movements. The same phenomenon of atrophy shows itself in the digestive organs; the minute structures in the wall of the stomach by which the digestive juice is produced undergo a partial atrophy. The lungs are stiffened; the heart is enlarged, but acts more feebly than in the young; the walls of the arteries lose their elastic qualities; the germ-cells cease their activity altogether; the weight of the brain becomes less; the respiration is depressed; the body-warmth is diminished; in short, there is an atrophy in all the organs. So Metchnikoff, for example, sees the nature of senility in the single word: "atrophy." "On résume la sénilité par un seul mot: atrophie." Other scientists see the chief cause of senescence in the changes of the vascular system. According to Osler longevity is a vascular question; this view has been well expressed in the axiom that a man is only as old as his arteries. Others lay much stress upon the disharmonies, the imperfect adaptations of the tissues within us to the performances of the body as a whole. According to Mühlmann the fundamental nature of senility lies in that diminution of the surface in proportion to the bulk of the body which is characteristic of the old. He concludes that we become old chiefly because we do not have proportionately enough surface left. Further, he regards "physiological death" as attributable to the breakdown of the nervous tissues, especially in the brain. Lorand attributes physiological death to the failure of one or more of the organs of internal secretion. Savill refers it, as Osler did, to the progressive loss of elasticity of the arteries, with or without renal complication. In short, every part of the circle has been made to appear the origin of the whole.

Two scientists of the Institut Pasteur made, in 1912, a minute study of the tissues of a woman of 93 who had died in consequence of an acute illness of only 36 hours' duration. An unusual opportunity was here presented of ascertaining the condition of the organs of a very aged person without confusion by the special injuries due to a protracted illness. They found a great number of abnormalities, including widespread sclerosis, leucocytic infiltrations, hypoplasia of the glandular tissues and calcification of the blood-vessels, and the choroid plexuses in the brain and spinal cord. The suprarenal glands were hypertrophied. Any one of these abnormalities might have led, either directly or indirectly, to death. While death might have been attributed to the particular lesion immediately responsible, yet this would in fact have only determined the mode of death, and mortality was, as Robertson put it, actually ordained by the underlying senescence to which all of the lesions were ultimately attributable. So senescence is of a general nature; as Child formulated it, senescence is merely one aspect of development, and one alteration is the cause of another or of many others.

Those alterations may be purely chemical. For instance, the physiological value of nearly all the connective tissues is due to their colloidal nature. According to the interesting investigations of Heringa and Lohr, the collagenous fibrillæ are nothing but a gelification, an arrangement of polarised ultramicrones in a row, and connective tissue is a thread-forming gel. This colloidal structure may be altered by chemical changes in the surrounding fluids: the elastic fibres will lose a great deal of their elasticity when they are overcharged with calcium salts. A change in the lymph fluid may cause a considerable loss of the solidity and strength of the collagenous fibres. In old age the connective tissue loses its elasticity and strength; it becomes dried up and the amount of water is markedly lessened. The colloidal substance of the elastic fibres, the elastin is also changed by old age. It changes into elacin, which is far less elastic than the elastin of the young tissues. This elacin has a greater affinity for fixating the calcium salts and the iron salts and its elasticity is thereby still more modified. Thus the changes in the connective tissue elements are mostly of a colloidal chemical nature and irreversible.

If the symptoms of age are chemical and irreversible, is there no delaying of old age, no rejuvenescence? Of recent years much has been written about the "rejuvenescence" which follows the hypertrophy of the interstitial cells of the testes, consequent upon suppression of the gametogenic function by ligation of the spermatic ducts or the implantation of sexual glands from other and younger animals. The data presented by Steinach, however, or even those of Voronoff, indicate in animals so treated no evidence whatever of rejuvenescence in the sense of the delay or overcoming of senescence. The effect appears rather to be stimulative, possibly an acceleration of metabolism consequent upon the synchronous stimulation of several endocrine organs. It may very well be questioned whether such stimulation, the extent and force of which is not to be measured or regulated, in a senescent and exhausted organism may not rather be a disadvantage and even a danger. The evidence upon which Steinach appears chiefly to depend is a reawakening of the sexual instinct, a form of "rejuvenation" which is far from desirable in the aged. As might be expected, the outcome of the operation in some instances has been disastrous. Voronoff, on the other hand, assures us that in many cases he has obtained a marked and indisputable degree of real rejuvenescence by transplanting into aged animals sexual glands or one of the other endocrine glands. In the case of aged human beings, however, even his results seem to me to be still very doubtful.

According to Child, senescence is merely one aspect of growth. This is fully in accordance with the view of Minot, who years ago showed that senescence is not a feature of old age but shows itself, so to speak, already in early youth. Old age is simply the period of retardation of growth, of very slow decline, whilst senescence is at its maximum in the very young and its rate diminishes with age. Senescence depends on the differentiation of the cells, and natural death is the consequence of cellular differentiation. So we have to look at the problem of growth to understand the problems of senescence and old age.

The Problem of Growth.

The problem of growth may also be looked at from the chemical point of view. In the first place the rate of growth is not always the same, and periods of very slow growth are followed by periods of very marked acceleration. Thus the rate of growth during the first part of the period of gestation is very slow, but it is succeeded by an extraordinarily rapid accretion of tissue during the months immediately before and after deliver. Towards the end of the first year of extra-uterine life a definite slackening of growth occurs and this is succeeded by the relatively rapid growth of the third, fourth, and fifth years of life. Another pause or slackening ensues, to be followed by the energetic growth which accompanies adolescence (Robertson). Similar phenomena are exhibited in the growth of every animal. They led Minot to his thesis that the slackening of growth after the first peak of the growth curve is the beginning of the process of senescence.

It was pointed out years ago by Robertson that this phenomenon—a process which takes place at first slowly, later with greatly accelerated velocity and later still as slowly as it began—is seen in a number of chemical processes in which organic substances play a rôle; where the processes are what is called "autocatalysed" or self-accelerated. The fact that the reaction has occurred is, up to a certain point, a favourable condition for its further occurrence. Seen as a chemical process, the process of growth is autocatalysed; it develops accelerative agents as it proceeds. Robertson was therefore able to show that the process of growth, its acceleration and retardation, assimilation and decomposition, may be represented by the same curve and its course expressed by the same mathematical formula as an autocatalysed chemical process. In fact, it may be analysed as a distinct chemical reaction or a series of chemical reactions dependent on the velocity of the slowest reaction, which Robertson calls the "master-reaction." Not that the reactions of growth are simple reactions; the process of protoplasmic synthesis is exceedingly complex, involving multitudinous parallel, successive and independent reactions. Nevertheless, as Robertson pointed out, we may conclude that, in the chain of processes which culminate in the production of living matter, there is one reaction which is slower than the rest, so that the whole concatenated series of events waits upon this reaction, which may be called the "master reaction." So we could bring down the problem of growth, and of its velocity and acceleration, to the study of the "master reaction," which is probably of a very complex, multi-molecular type, and thus look at it from a chemical point of view, as Chodat did when he showed that in plants cellular multiplication, which of course underlies the process of growth, is autocatalysed. According to Chodat the catalyser is the living cell itself, but in animals the processes of growth and cellular multiplication are far too complex to be explained so simply, and we have to look for other processes by which the growth curve may be influenced. When we try to look at the problem of growth from this chemical point of view, to study the master reactions, and to look for retarding and accelerating influences, we see that a vast field of interesting research lies barren, and that in this way we may get a better insight into the process of growth and thence into the histological basis of health than from any other point of view.

To give a curious example, we see, as Gurwitsch has shown, that multiplying cells send out peculiar rays of a very short wave-length by which other cells are induced to divide and to multiply themselves, so that the process of cell-division is catalysed. We see that the accessory food factors of Gowland Hopkins, the vitamins of Eykman, have a distinct influence on the rate of growth. For example, the fat-soluble accessory contained in butter is essential for the growth and reproduction of animals (Hume, Masing). Adult rats are able to withstand its absence from their diet for over a year without loss of weight, but if previously, in the growth period, they have been confined to a diet deficient but not altogether lacking in it, then subsequently when they are nearly adult deprivation causes, after some delay, a sudden decline of weight and ultimate death from apparent inanition or from intercurrent disease. When young animals which have hitherto received normal nourishment are suddenly deprived of this factor, they continue to grow for a considerable period, but growth cannot be sustained and the arrest of growth is followed by progressive loss of weight (Robertson). The water-soluble accessory factor, the original vitamin studied by Eykman, which is present in leguminous seeds and in the germ of cereals (from which it was secured in crystalline form by Jansen), has the same properties. It is essential for the growth of young animals and children, and indeed the effect of its deficiency in the diet is much more rapidly evident than the effects of deprivation of the fat-soluble accessory. But not only is growth suspended; other abnormalities too are displayed when it is absent—e.g., cessation of the growth and multiplication of the germ-cells, atrophy of the lymphoid tissues and of the thymus gland, and diminution of the number of lymphocytes in the blood. We may safely say that all the known vitamins play an important part in the acceleration and retardation of growth, in the formation of hormones, in short as catalysers in the chemical processes of the body. In the same way we may attribute to the formation of autocatalytic substances the stimulating effect of certain hormones upon the growth of certain tissues—viz., those which give rise to the secondary sexual characters.

It is of great interest to study the effect of nutrition upon growth from the chemical standpoint. That good food is necessary nobody will ever deny, but we must not overrate the influence of food upon the essential factors of growth. Many animals are known to take no food during metamorphosis; they therefore feed on their own tissues, and get smaller during development. Even in starvation the nutrient level is never at zero, and cells possessed of a very low nuclear ratio—i.e., not differentiated—may actually multiply at the expense of the other tissues of the organism, as when a wound heals or regeneration occurs in a starving animal. Even in starvation Nature strives by all possible means to maintain the dynamic equilibrium of the body. The cells become smaller, but the relation between the nucleus and the cytoplasm, the nuclear ratio so important for the metabolic processes inside the cell-body, remains the same as long as possible. When it is altered it becomes as in periods of intense growth, so that we can speak of a rejuvenescence of the organism analogous to the condition in the embryo, where the cell-body is likewise small in relation to its nucleus. Thus we can understand the interesting fact, first demonstrated by Morgulis, that there is in different animals a great acceleration of growth-rate after a period of inanition. If, as Morgulis pointed out, at a certain period of growth in salamanders the proportion of food converted into protoplasm was 26 per cent., after starvation and readmission of food it rose as high as 73 per cent. Kahan, a Russian investigator, found (I quote again from Robertson) that rabbits after 17 days of inanition, when they had suffered a loss of 31 per cent. of their body-weight, gained 56 per cent. in weight on a diet even less sufficient than that which could maintain them in a state of equilibrium under normal conditions. In other words, a diet which before barely permitted maintenance becomes, after a period of starvation and even at the same body-weight, a diet which permits growth. Retarded individuals in any random group of children generally exhibit a late acceleration of growth; in this connexion we can point to the compensatory overgrowth which succeeds the postnatal loss of weight in infants. Furthermore, those organs which are most essential to the preservation of existence are those which suffer least extensively from the deprivation of food, as, for instance, the heart and the central nervous system. Their autocatalyst level rises at the expense of the less important organs and cells. Thus the problem of growth and nutrition brings us to the problem of the differentiation of the tissues and the cellular units.

The discussion of the histological basis of health has therefore brought us gradually down from the general principles by which our organism is governed—harmonious development, and the harmony in the functions of the adult and its alterations by senescence—to the details of nutrition and to the differentiation of the cells and tissues.

STANDARD RATINGS FOR X RAY APPARATUS.

WE have received from Messrs. Watson and Sons (Electro Medical), Ltd., a catalogue entitled "High Tension Transformers." It is a booklet of 47 pages, a third of which is devoted to the simple physics of modern X ray apparatus, the remainder describing the large variety of X ray sets made by this well-known firm. The principle and construction of X ray transformers are briefly described, and the rectification of the current from high tension transformers, more especially by valve tubes, is also dealt with. The importance of the testing of transformers is emphasised, and it is with pleasure that we notice that this firm has adopted the standard ratings for X ray transformers proposed by the British Electrical Standards Association to which we referred recently (Dec. 28th, 1929, p. 1374). The current from a transformer is alternating in character and an effective value which takes an account of this fact is adopted in the standard specification. The current from an X ray set complete with rectifier is, however, unidirectional. For sets of this kind Messrs. Watson and Sons have adopted ratings similar to those proposed for X ray transformers except that the effective value of the alternating current of the latter is replaced by the reading afforded by the milliammeter when the set is working under the specified conditions. The catalogue is replete with diagrams and excellent photographs of X ray apparatus.

EARS OF CORN EXTRUDED THROUGH THE CHEST WALL.

THE LONG ARM OF COINCIDENCE.

To the Editor of THE LANCET.

SIR,—In your issue of Jan. 11th appeared the story of a child of 3½ years in Staffordshire who had sniffed into his lungs a one and a half inch long grass seed, and after considerable travail had delivered this through an abscess in the right scapular region. In the *British Medical Journal* of the same date appeared a report of a similar case in which a child of 9 months in Hertfordshire had inhaled a one and a half inch grass seed and had got rid of this through its right scapular region. How few of your readers will have seen or heard of such a case, and how unlikely that two such cases should have been under treatment in September last year, and should have been brought to the notice of the medical profession in the same week!

I am, Sir, yours faithfully,

PERTINAX.

Mr. Vincent Patrick, who (with Dr. E. H. Coleman) described the case in our own columns, sends us a letter he has since received, making the third which has come to his knowledge. This letter runs:

> Dear Sir.—I have taken the liberty to write to you about the boy that swallowed the grass ear, as my son, aged 17, swallowed one 16 months ago. He was very ill, but as he did not tell us he had swallowed the ear, a doctor treated him for rheumatic trouble. After he had been in bed a few days he had a swelling at the bottom of his left lung, and of course I put hot fomentations on, as I thought it was an abscess. While I went downstairs to get some water to wash him, he got out of bed and, looking over his shoulder in the looking glass, saw the swelling, which he pressed, and the grass burst out right to the other side of the room. The smell of the stuff that came away was terrible. I had to put a handkerchief over my nose. He now has a nasty hacking cough sometimes at night. I have got the grass in a bottle, but it has broken in two. The grass ear must have passed right through his left lung.
>
> I remain, yours respectfully,
>
> Mrs. X——.

An ear of rye grass was shown to the Clinical Society of London nearly fifty years ago (THE LANCET, 1882, i., 350) by the late Sir Rickman Godlee. This ear had been "swallowed" by a child two years old, and 43 days later made its exit through the back between the sixth and seventh ribs, three inches from the spine on the left side. He thought the grass had probably entered the œsophagus and not the trachea, the cough being due to some accompanying pleurisy. At the same meeting Mr. R. W. Parker related the case of a child in whom a swallowed piece of grass emerged through an abscess in the left side, the contents of which had a distinct fæcal odour; and Mr. Golding Bird mentioned an ear of rye grass covered with pus which had been brought to him by a friend with the story that it had been swallowed by a girl, eight years of age, who suffered for a year from illness believed to be phthisis, but who recovered after the ear of grass had presented in an abscess under the left breast.

THE BRITISH RACE IN MEDICINE.

A LECTURE delivered recently by Dr. R. O. Moon, under the auspices of the People's League of Health, proved of interest to the audience because the lecturer, while narrating historical facts concerning many great names, was able to point to the characteristics which were displayed by the various discoverers connected with British medicine. The great Sydenham emerges as a very British type. Of learning, as such, he seems to have had a deep distrust, but on the necessity for close personal observation, and for collating the phenomena of disease with those of natural history, he was emphatic. He classified great diseases and made sound pathological deductions, but seems to have entirely overlooked Harvey, who had published the *De Motû Cordis* when Sydenham was only four years old.

DETECTION OF POISONS BY THE SPECTROSCOPE.

THE delicacy of the spectroscope as a method of revealing traces of elements far too small to detect by any of the usual chemical tests is well known, so little as 10^{-9} gramme of sodium being revealed by this means. Emission spectra have come to be recognised as the most reliable criteria for the identification of elements where only small quantities of material are available. The use of absorption spectra for the detection of alkaloids in solution was described so long ago as 1903 by Dobbie, but this aspect of the subject has only comparatively recently received attention from toxicologists. The significance of absorption spectra has lately been much in evidence in connexion with work on vitamins. The publication of a 17-page pamphlet entitled "The Detection and Investigation of Poisons by Spectroscopy," by the firm of Adam Hilger, is therefore timely. The subject matter is divided into three sections entitled Applications, Equipment, and Methods of Working. Under the first heading are given specific examples of the employment of the method with reference to original papers. The section on Equipment gives particulars as to cost of outfit, while a brief description of working details is given in the last section. A perusal of the pamphlet will impress the reader with the great potentialities of the spectroscopic method of examination when placed in the hands of competent workers.

TREATMENT OF CANCER AT THE BRISTOL ROYAL INFIRMARY.

To the Editor of THE LANCET.

SIR,—In view of the unauthorised and misleading statements which have appeared in certain sections of the lay press the Faculty of the Bristol Royal Infirmary would be glad if you would allow them to state very briefly the true position with regard to the treatment of cancer here. A considerable amount of research has been carried out, both clinically and in the laboratory, and special beds have been set aside for the study of cancer. A number of patients have been relieved, in some cases to a very gratifying extent, by lead compounds and other methods of treatment, but some unfortunately show no improvement, and no claim to have achieved a cure has ever been made. Details have appeared, on more than one occasion, in medical publications.

I am, Sir, yours faithfully,

R. C. CLARKE,

Hon. Secretary to the Medical Faculty,
Jan. 15th, 1930. Bristol Royal Infirmary.

A PERMANENT HOME FOR CHRONIC INVALIDS.

THE search for an inexpensive permanent home suitable for chronic invalids, especially those helplessly crippled by rheumatism or totally incapacitated by poliomyelitis or disseminated sclerosis, is often fruitless. Our attention has been called to one recently established by two registered nurses at The Oaks, Malden-road, New Malden, Surrey (Malden 1264). The home is five to eight minutes' walk from Malden Station, whence trains leave for Waterloo every five minutes. At present accommodation is available for nine patients, divided into one room with three beds, two rooms with two beds and two single rooms. There is a common room for the use of patients who are not bedridden and an attractive garden. Patients can choose their own medical attendants, arrangements being made for those who come from a distance. The fees are from 2½ to 6 guineas weekly, excluding medical fees and personal laundry. Patients' friends are admitted at any time during the day, and can be accommodated for short periods.

SEROLOGICAL DIAGNOSIS OF MALIGNANT DISEASE.

THE Lega Italiana per la lotta contro il cancro offers a prize of 15,000 lire for an original paper, written from a critical and experimental standpoint, on the Value of Serological Methods in the Diagnosis of Malignant Tumours. The paper will be judged by a committee of three, appointed by the President of the League. The papers must be typewritten, anonymous, and sent in duplicate to the headquarters of the League (Rome (33) Via Triboniano, presso Piazza Cavour, Casa dol Mutilato) in a closed envelope, bearing a motto on the outside. The same motto must be written on another closed envelope containing particulars of the author's name, address, &c. Papers must reach the above address not later than June 30th, at midday. The League reserves the right to publish the winning paper, for the first time, and in Italian, in its Bulletin.

COLONIES FOR MENTAL DEFECTIVES.—The Board of Control, with the approval of the Minister of Health, have appointed a committee to consider and report what are the essential structural requirements of a complete colony for mental defectives of all types and to what extent the cost could be reduced by the adoption of semi-permanent or temporary buildings or other new methods of construction, having regard to the comparative cost of maintenance as well as the initial capital expenditure involved. The Committee is constituted as follows:—Mr. Walter Hedley, K.C., Recorder of Newcastle-on-Tyne (Chairman); Mrs. F. Rose Davies, J.P., Alderman, Glamorgan County Council; Miss Clara Martineau, J.P., Member of the Birmingham City Council; Sir George Oatley, F.R.I.B.A.; Dr. A. Rotherham, Commissioner of the Board of Control; Mr. A. Scott, A.R.I.B.A., Chief Technical Officer, Ministry of Health; Sir Lindsey Smith, J.P., Chairman of the Board of Governors of Holloway Sanatorium; and Dr. F. Douglas Turner, Medical Superintendent of the Royal Eastern Counties Institution, Colchester; with Mr. H. J. Clarke, of the Board of Control, as Secretary.

A Contribution
TO THE STUDY OF THE
TREATMENT OF EPITHELIOMA OF THE TONGUE BY RADIUM.

Being a Hunterian Lecture delivered before the Royal College of Surgeons of England on Jan. 29th, 1930,

By G. E. GASK, C.M.G., D.S.O., F.R.C.S. Eng.,
PROFESSOR OF SURGERY IN THE UNIVERSITY OF LONDON.

In presenting this study I wish to say that it is really a contribution from the members of the Surgical Unit of St. Bartholomew's Hospital, of which I am the mouthpiece. We feel that the time has come to consider, more in detail than was previously possible, the relative value of treatment of carcinoma of the tongue by the old-established method of surgical excision and the new, much hoped for, rather spectacular, and not yet fully established treatment by radium. The amount of information at our disposal is still too small to arrive at definite conclusions, but it is important to consider what there is, seeing that in a short time the amount of radium in the country will be considerably increased. Following the Thanksgiving Fund for His Majesty's recovery and the foundation of the Radium Commission, a number of national radium centres are about to be started in the University medical teaching centres of England, Scotland, and Wales, so that in a short time we may expect a great stimulus to the radium treatment of patients suffering from cancer, and among these there are sure to be many suffering from cancer of the tongue. It seems to us, therefore, an opportune moment to take stock of the knowledge which is now available, to table the results obtained by surgery, and to scrutinise with care and without fear or favour the results and methods of radium treatment.

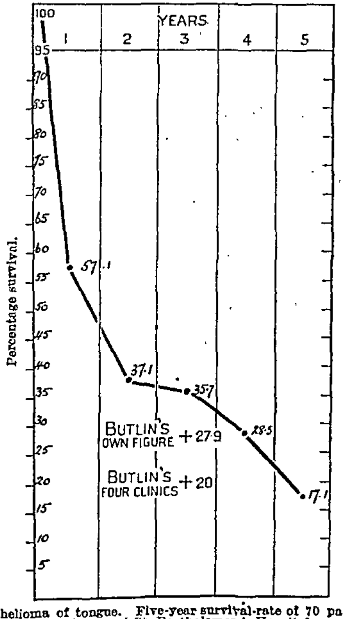
Results of Surgery.

We have tried first to reach the approximate figure of the cures of cancer of the tongue obtained by surgery, so as to have a fixed point for comparison between surgery and radium therapy. Operations for removal of the tongue have been performed by surgeons now for many years, and we ought to be able to give accurate detailed figures for the results of surgery in all the different phases of the disease. Unfortunately, the medical profession has appeared unbusinesslike in the matter of compiling statistics, and slow in adopting follow-up schemes, with the result that it is difficult to find a large number of conclusive figures. Statistics are cold, heartless, things, which do not recommend themselves to optimists, but it is necessary to inflict some of them on you.

Statistics of St. Bartholomew's Hospital.

In 1922 a follow-up department was started at this hospital for the purpose of tracing the end-results of all patients suffering from cancer of the tongue. The results are shown on the accompanying graph. Included in this series are all those patients who were deemed operable, and were, in fact, operated on in one way or another by the various surgeons attached to the hospital. The results of the varying types of operations are not differentiated, as it was thought that the figures wanted were those that showed the value of surgery as a whole. Three years is not a long enough period to judge of any form of treatment of cancer, so only those patients have been included in this review who might have survived five years from the date of their original operation. Of these there were 70, of which only 12 remained alive and well and free from recurrence at the end of five years from the date of their operation. That is to say, there was a survival-rate of 17·1 per cent. (It is interesting to note in passing that if the period of observation had been continued for longer than five years the percentage of so-called "cures" would be still further diminished, for of the patients noted above as remaining well for five years three showed recurrences at the close of six years, and two at the end of seven years.)

Mr. R. F. Phillips, Luther Holden Scholar, who is now working on the end-results of patients suffering from buccal carcinoma (including carcinoma of tongue, floor of mouth, cheek, lip, tonsils, and palate), has supplied the following interesting figures which may later throw some light on the problem being studied. He holds that buccal carcinomata show degrees or grades of malignancy, which may be measured and foretold by their histology. Following Broders's[1] work, Mr. Phillips has examined the histology of the tumours from a large number of patients who have been treated at St. Bartholomew's Hospital between the years 1924 to 1927. These are divided into four grades, according as they show cells approaching the normal tissues or differing greatly from the normal and approaching the embryonic type. Thus, Grade 1 contains those cases which show much cell-nest formation and few mitoses, and Grade 4 those cases which show no cell-nest formation and much mitosis: whereas Grades 2 and 3 are intermediate.



Epithelioma of tongue. Five-year survival-rate of 70 patients operated on at St. Bartholomew's Hospital.

The 159 patients observed fell into the following grades:—

Cases and Percentage.

Grade 1	21	(13·2)	Grade 3	50	(31·4)
„ 2	73	(45·9)	„ 4	15	(9·4)

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[1] Broders, A. C.: Grading of Carcinoma and Practical Application, Minn. Med., 1925, viii., 736; and Epithelioma of Cavities and Internal Organs of Head and Neck, Arch. Surg., Chicago, 1925, xi., 1.

Thus, it will be seen that the largest number falls into Grade 2 and the smallest into Grade 4, the most malignant category. Mr. Phillips next worked out what happened to the patients in these various grades and tabled the survival-rate in each. He believes that the prognosis or chance of survival is definitely related to the type of growth. Thus, he finds that the survival-rate in

Per cent.
Grade 1 is 36·4 }
,, 2 is 18·2 } at the end of three years.
,, 3 is 8·0 }
,, 4 is 0 (all dead).
Number of patients followed, 90.

It should be interesting to find out whether any of these grades are more or less susceptible or sensitive to radium. There is some evidence to support the view that the cases falling into the first group—namely, those showing marked cell-nest formation with little mitosis, are less sensitive to radium than those highly malignant types in Group 4. More work is required, however, before this can be stated as proved.

Selection from Published Sources.

The results of surgery obtained by us at St. Bartholomew's Hospital are so bad that it seems only right to compare them with a selection taken from the published sources. Naturally, one's mind turns first to the publications of Sir Henry Butlin,[2] a Past-President of this College, who had the highest reputation for his work on cancer of the tongue.

Butlin gave a list of 197 cases of carcinoma of the tongue, which comprised all those operated on by him, the first of which was in 1881 and the last in 1908. Of these 197 patients, 55 lived for three years or over without recurrence—that is, he had a survival-rate of 27·9 per cent. at the end of the three-year period. The recent St. Bartholomew's Hospital figure at the end of three years is 35·7 per cent., so that there is not much difference between the two.

Butlin also quoted the combined figures of his own and three other clinics—namely, those of Whitehead, Krönlein, and Kocher. The combined figures of these four clinics showed a survival-rate of 20 per cent. at the end of the three-year period.

The survival-rates given by a number of other authors are: 18 per cent. by Capetti; 26·6 per cent. by Caird; and 14·3 per cent. by Cobb and Simmonds.[3]

The Mayo Clinic figures for the years 1910 to 1922 show a survival-rate of :—

30·8 per cent. at the end of 3 years.
24·4 ,, ,, 5 ,,
4·25 ,, ,, 10 ,,

A general survey of these figures, showing the results of operations for cancer of the tongue taken from clinics in various parts of the world, leads us to the conclusion that the best we can expect from surgery is a survival-rate of from 20 per cent. to 25 per cent. This is the basis on which the results of radium treatment can be compared.

RESULTS OF RADIUM.

At this point it is appropriate to turn back again to consider an almost prophetic utterance made by Sir Henry Butlin[4] 21 years ago, shortly before his death.

> "At this moment, it would scarcely be too much to say that the air is charged with the emanations of radium. We are told that epithelioma of the tongue can be cured by radium. Had I been asked my opinion on this question a month ago, I should have said that, although two or three people in different parts of the world have claimed this power for radium, the general belief is that rodent ulcer is the only variety of malignant disease which radium is competent to cure. And I should have added that the only case of epithelioma of the mouth in my own practice to which radium had been applied (by the most skilful man with the best material) had ended disastrously. But I have, within the last few days, seen a case in which a typical epithelioma of the inside of the cheek is so much better, under the application of radium, at the end of four months, that it looks as if it would be quite cured. And this had apparently been accomplished without inflammation or sloughing or profound ulceration of the disease. I understand that the radium in this case was applied by means of the disc. As this epithelioma was about 1¼ inches in diameter and ulcerated all over, when I saw it four months ago, there seems no reason to doubt that small epitheliomata of the tongue may be removed by radium, probably with a better scar than would be left by any other efficient agent. But, having said this, it must not be forgotten that the removal of the primary disease is only part of the cure of epithelioma. Even the smallest, the youngest, and apparently the most insignificant epithelioma of the tongue is capable of affecting the lymphatic glands, as the cases I have related show. So that, unless radium is discovered to possess a far-reaching influence, spreading from the seat of the primary disease to the associated lymphatic glands, I am afraid that the surgeon must still occupy an important place in the treatment of epithelioma of the tongue."

Is not this a very remarkable forecast? It is humbling to realise that 21 years have passed since it was made, and that progress has been so lamentably slow. What one would like to be able to do now is to state the results of the treatment of epithelioma of the tongue by radium and to compare them with those obtained by surgery. At the present time these figures are too few and too recent to be of any great value, though it is greatly to be hoped that in a few years adequate and reliable figures will be available. The Radium Commission has adopted the policy of asking all the national radium centres which are being started to keep their records on uniform case sheets. These records in due course are to be collected and analysed, so that in the near future we may expect to have at our disposal a very large number of figures which should prove of great value.

There are, however, a few figures which have been published which are worth looking at. G. E. Birkett,[5] of the Manchester Radium Institute, who has done splendid pioneer work with radium, states :—

> "There are no five-year figures available in this country, but continental workers report about 45 per cent. of five-year cures as regards the primary site, and 20 per cent. of absolute cures."

I gather that the figure of complete cures over a three-year period from the Manchester Radium Institute is 22–50 per cent. This result is not incomparably better than that obtained by surgery.

Roux-Berger and Monod,[6] from the Radium Institute of Paris, report that during the six years 1920 to 1925, inclusive, they treated 287 cases of epithelioma of the tongue, out of which number 77 were cured. By "cured," they say they mean those patients who were free from disease on Feb. 1st, 1927. This gives a percentage of cures of 26·8, or if a three-year period is taken on a total of 120 cases, 21·6 per cent. This is not as high a percentage of cures as one might have hoped for, and again does not appear to be much better than the results of surgery.

Radiumhemmet in Stockholm reports that, from a list of patients treated during the years 1921 to 1926 (inclusive), 14 are alive and well out of 46 treated; a survival-rate of 30·4 per cent. This again seems to be no better result than that obtained by surgery. At the same time they report a 78·3 per cent. survival-rate of cases of epithelioma of the lip at the end of two years.

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[2] On the Results of Operations for Carcinoma of the Tongue. By Henry T. Butlin. Prepared for the Meeting of the International Society of Surgeons at Brussels, Sept., 1909. London: Adlard and Sons, 1908.

[3] Cancer of the Mouth: Results of Treatment by Operation and Radiation. By Channing Simmonds, Surg., Gyn., and Obstet., 1926, xliii.; Carcinoma of Tongue, Judd and New, Surg., Gyn., and Obstet., 1923, xxxvi., i.

[4] On the Early Diagnosis of Cancer of the Tongue and on the Results of Operations in such Cases. By Henry T. Butlin, Brit. Med. Jour., 1909, i.

[5] Radium Treatment of Buccal Carcinoma, Brit. Jour. of Surg., Jan., 1930; see also Amer. Jour. of Physical Therapy, 1928, v.

[6] Radiophysiologie et Radiotherapie. By Regaud. Vol. i., fasc. ii., Paris, 1928.

It is admitted that these figures are few in number and recent, but it looks as if the final results are not startlingly better than those obtained by surgery. There are, however, some qualifying remarks to be made a little later.

A SURVEY OF THE WORK OF THE SURGICAL UNIT, 1928–29.

We now present to you a detailed account of those patients treated in the Surgical Unit during the years 1928 and 1929. The number is not great, but a careful study of even a small number of patients cannot fail to be of value, and certain deductions can be drawn.

The method of treatment of the primary growth of the tongue has been by radon seeds, of a strength varying from 1·5 mc. to 3 mc. The seeds were encased in platinum capsules of a thickness of 0·3 mm., increased later to 0·5 mm., so as to minimise burning. On an average the seeds were left in for seven days. The reason why radon seeds were used and not radium needles was, in the first instance, merely one of convenience. Seeds were available at a time when suitable needles were not, and further it appeared to us that seeds were more adaptable than needles for placing in the folds and crannies of the mouth. We hold no brief for radon as opposed to radium, but we only want to find out the truth. There seems to be an impression that the emanation is not as effective as the element on account of the rapid disintegration of radon. Physicists say that there ought to be no difference between the action of radon and radium, provided that a suitable dose be given. Our own observations tend to bear this out.

The glands in the neck have been treated in the main by a barrage of radium needles, inserted at the same time as the seeds in the tongue and arranged according to the accompanying diagram. Needles containing radium element were used in this instance as it was desired to irradiate large areas of tissue containing lymphatic glands. The needles were inserted by puncture and, as far as we know, no damage was done to any of the structures in the neck. The advisability of using needles for treating the glands of the neck, or of dissecting the glands, or of combining surgery with radium treatment, will be discussed later.

Deductions Drawn from an Analysis of 30 Cases.

There are certain points arising out of a close study of these figures which are worthy of comment. In the majority of cases the tongue has been materially affected by the action of the radon seeds; in the majority the original primary tumour or ulcer has disappeared entirely in the course of a few weeks and the tongue has been left a mobile useful organ.

In one instance (Case 10) the carcinoma was, as far as we could see, entirely unaffected by the action of radon seeds, and later the tongue was excised. The reason why this epithelioma did not react to the rays is unknown to us. Perhaps it was non-sensitive to radiations. Histologically it fell into Group 1 classification, that is to say, it showed well-marked cell-nest formation. Perhaps the seeds were below strength; perhaps they were not placed accurately. In another instance (Case 25), a woman with an easily accessible ulcer close to the tip of the tongue, the carcinoma was not materially influenced by the action of the radon seeds and her tongue has been excised. The histological findings show that she also falls into the Grade 1 classification. Perhaps these cases might be used as an argument for the use of the element rather than the emanation.

The question of the non-radio-sensitivity of some tumours is very puzzling and requires investigation. It emphasises the fact that we are still very much in the dark about the whole problem, and that our treatment is still empiric. There were six other patients in whom the tongue was not healed by the treatment. These may be accounted for in the main by the fact that the growths were extensive and infiltrating. Quite a number were advanced and inoperable. We were not trying to produce a unique record of cures, but endeavouring rather to see what could and what could not be done.

One thing that is perfectly clear is that if the primary growth is treated early it can be made to disappear by the use of radon in the great majority of cases, leaving a useful mobile organ. We know also from the work of others that the same result may be obtained by radium element. I repeat that we are not arguing here in favour of the emanation against the element, but merely trying to record the facts as we have seen them.

The second point is that the patients who have died, and there have been ten—a third of the total number—have been advanced cases of carcinoma, cases which would have been classed as inoperable surgically, cases which had in all probability dissemination of disease at the time of treatment. This is to emphasise once again the point that treatment, if it is to be successful, must be before the disease is advanced and disseminated.

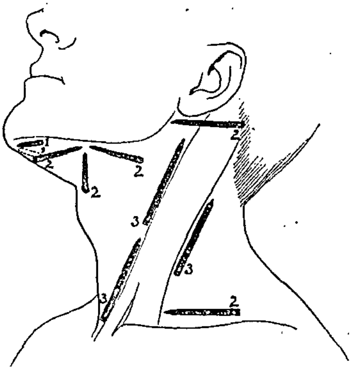


Diagram showing method of irradiating lymphatic areas with radium needles. (Figures refer to milligrammes of radium element in needles.)

The third point that arises prominently from these figures is the unsatisfactory state of our knowledge of the right method of treating the lymphatic glands. It will be noted that the method of treatment adopted by us has varied. In the majority of cases the method of irradiation by radium needles inserted through punctures in the skin has been used. This method has appeared to us to be satisfactory when applied to the lymphatic gland areas in cases of carcinoma of the breast. But it has not turned out uniformly satisfactory for the glands secondary to carcinoma of the tongue.

In seven instances, Nos. 6, 9, 14, 20, 22, 24, and 27, the glands have not responded. Six of the patients have died, and one—Case 27—will probably die soon. In a number of patients regression or disappearance of the glands has been noticed after irradiation, and, although this is encouraging, it is not proof that the glands were secondarily infected with carcinoma and that they were sterilised by radiation. It is well-known that glands which are palpable clinically are often shown histologically to be inflammatory and not carcinomatous. We have no direct evidence that radium puncture does actually sterilise carcinomatous glands. In some instances the glands have been dissected, and it is possible that this should be, at any rate for the present, the method of choice.

toxin combining with a tissue. The experiment of Pasteur, showing how a normally immune hen can be inoculated with disease if her temperature is lowered (or if the rate of atomic vibrations is lowered) may be an illustration of such a hypothesis.

Immunisation has been considered up till now merely as a biological phenomenon. I want to show you to-night how immunity, and even specific immunity, can be acquired from non-organic antigens.

A Few Experimental Facts.

I am anxious you should feel the solid rock of facts underlying this far too speculative discourse. Sparteine sulphate, in a dose of 7 mg. injected into an animal of 100 grammes in weight, is always fatal. Now if a higher dose, say, 10 mg., of the poison is mixed within the syringe with 5 c.cm. of mineral water from La Bourboule or Mont Dore springs, the animals do not present any symptom of intoxication. But if you use a similar dose of Chatel Guyon water, death is again bound to follow. On the other hand, this Chatel Guyon water neutralises the venom of the adder. And St. Nectaire water acts in a similar way against diphtheritic toxin. The toxin of tetanus is checked by La Bourboule water and not by Mont Dore, phallin poison by Mont Dore water and not by La Bourboule.

This is not true only for toxins treated in vitro; these various protective actions develop exactly in the same way if these various waters are injected hypodermically. But we must consider this extremely striking fact, that such protection, or *phylaxis* does not develop immediately, and only reaches its maximum after seven days. There is a period of incubation for phylaxis to develop, just as there is an incubation period for the toxin to develop its action.

As regards the protective action of certain mineral waters against certain microbes, there is no doubt experimentally that it does exist, but we are still in the early stages of elucidating the matter. How deeply do we feel the terrible loss Science has sustained from the premature death of Prof. Billard, the pioneer in this field of investigations!

We do not pretend that mineral waters have any sort of monopoly. They are an easy and cheap way of producing immunisation, but other electrolytes will certainly be discovered or invented which are endowed with the same property. Experiments made by that well-known biologist, Auguste Lumière, show that immunity—the production of antibodies—may be due to well-defined chemical bodies, such as saponin, a property that seemed to be exclusive to proteins. This goes so far that the serum of animals thus immunised acquires a protective action. We might call it chemical serotherapy. The protective action, this immunising action, by mineral waters is a new discovery, a most startling discovery, and one that is worth our active attention.

Mineral Water in Anaphylaxis.

Now I will ask you to consider, from a different point of view, the part which mineral waters play in the phenomena discovered by our great physiologist, Prof. Ch. Richet, which he calls anaphylaxis. Let us return to the solid ground of experimental facts.

If an animal be injected with horse serum and treated for 21 days with a daily injection of Vichy water, after which treatment a second dose of horse serum is given hypodermically, then the untreated control animals are found to die or become gravely ill, whilst the treated ones do not show the slightest reaction. This protective action is given also by Royat and La Bourboule waters. This is not merely the result of the action of water on a toxin. It is a true defensive reaction. It is due to the action of the bivalent bodies of the mineral water creating around the cells an electrostatic field of protection. We shall further consider presently this problem, which was studied and solved by Loeb, the American biologist. The phylactic action of mineral waters is far from being a general property. Prof. Perrin has experimented with the waters in the east of France. The results were positive with the Contrexéville and Vittel springs, negative with Luxeuil and Bourbonne. It is evident that the protecting property is not due to chemical composition. It does not develop if the waters are replaced by solutions of the same composition. Prof. Perrin suggests that it is the physical equilibrium that determines it, and most especially ionic dissociation.

We said a three-weeks treatment, and is it not a curious coincidence that the length of a "cure" in a spa has been fixed by clinical empiricism at exactly the same period?

Billard's Discovery.

The immunising property of mineral waters must certainly appear to you, as it does to me, as a most remarkable fact, and probably you are anxious to know how this discovery was made and why it should occur to any human brain to try such experiments. We might say hazard. Yes, but chiefly observation and open-mindedness, and perhaps a touch of genius. The story starts in so pretty a way that I fear I cannot resist the temptation of telling it.

Let us suppose ourselves transported to the centre of France, to the picturesque, volcanic district of the Auvergne mountains, a few years ago. It is a cold early spring morning, and the old shepherd has just given an outing to his flock after the long winter stabling under the snow. You may imagine the man, grey clad, standing like a statue on a black rock, leaning on his stick. The sheep are enjoying the fresh air, but there is very little to satisfy their appetite—just a few young green heads of broom, sprouting out where the snow has vanished.

Then watch a vigorous, middle-aged man climbing up the hill. He has escaped from his physiological laboratory in the medical school of Clermont Ferrand. It is Prof. Billard himself. He stops to talk to the peasant. The shepherd has two great opportunities of becoming an observer: time and silence. He listens to Nature. The scientist questions Nature. Well, it appears that at this time of the year the animals are depressed, and so clumsy that poachers have been known to outrun a wild goat. And, adds the shepherd, if bitten by a viper they suffer no ill-effects from the bite. A thought flashes through the mind of the scientist. To him the broom the sheep are feeding on implies spartein. These sheep are doped. And he knows that spartein is antagonistic to the toxin of tetanus. Why not to the snake venom, which has also a special affinity for the nerve centres? And down he walks towards his laboratory, determined to see the problem through.

Between spartein and the toxin there is a race for the nerve centres. If spartein reaches the goal first, it is too late for the toxin. Immunity is established. In order to diffuse spartein more rapidly through the organism, why not mix it with various electrolytic solutions? Billard has these solutions ready made at hand, and he tries the various mineral waters gushing up in his district. By chance he finds one neutralising the spartein he is experimenting with, and it is from this observation that he started his long series of researches, only stopped by premature death 12 months ago, from pneumococcal meningitis, within 24 hours of taking a winter stroll in his beloved Auvergne mountains.

Specificity and Sensibilisation.

We may here stop for a moment to consider by what means a certain mineral water may protect the organism against a specific toxin. A very similar point will arise when we have to consider the question of desensibilisation, and the part played by soaps. We may conceive that certain toxins, and for the sake of example we may select the tetanic toxin, have a special affinity, a positive chemiotaxy, for stearates. (And this may be inferred from the researches of H. Vincent.) Therefore, if a mineral water exists with electrolytes combined in such a way that with stearates it forms an insoluble soap, a barrier can be built, preventing the tetanic toxin from invading the neuron. The nervous tissues of those animals which are sensitive to adder venom fix the poison in vitro. But an emulsion of the neuron of the pig, an animal refractory to the venom, does not fix it. On the other hand, spartein is fixed by an emulsion of the neurons of all animals.

The question of time is of the utmost importance. Let us return to experimental findings. Tetanic toxin takes a certain time to develop its action, and the immunising action of the mineral water must be synchronised to the time of action taken by the toxin. For instance, we inject a dose of toxin lethal to the guinea-pig. One hour later we inject 10 c.cm. of La Bourboule water. The animal dies. The same result occurs if the water is injected three hours later. *The immunity has developed too soon. But if the* water is injected five hours later, the animal survives, because the immunising effect has occurred at the same time as the toxic action. If 12 hours elapse before the water is injected, then it is too late, and the toxin works before the immunising action develops; the animal dies.

Lipoids not Proteins.

If you want to understand such an action you must admit the working hypothesis of Billard, that we are sensibilised not by proteins but by lipoids. The fact is very likely, if we consider that coagulation by heat does not hinder in any way the anaphylactic effect of antigens. Why not admit, as a very likely possibility, that the lipoids are responsible? Billard himself has observed anaphylactic shock on guinea-pigs, prepared with lipoidic antigens from the calf and started with calf serum. Another instance of anaphylaxis by lipoids is the celebrated case described by the late Prof. Widal, of a sheep merchant who developed asthma from the mere smell of greasy wool.

If you admit such an hypothesis, then the part mineral waters play in the desensibilisation of the organism is made easier to understand, providing that in this instance again we consider saponification. Organic soaps mobilise not only lipoids but insoluble fats. It is an experimental fact that those mineral waters which dissolve soap most readily are exactly the waters endowed with the greatest power of desensibilisation against anaphylaxis. And if we examine such a mechanism from a different angle, we may admit that these waters introduce into the organism active electrolytes, which disperse the soaps and mobilise the lipoids more easily.

If such be the case, then we can foresee a new class of drugs, acting merely by virtue of their physical properties; in other words, by vibration. The production of such a material has been achieved by Roger in his laboratory of La Sorbonne in Paris, and the results appear quite satisfactory. It is used externally, in the same way as an embrocation. How it really acts is still a problem. Experiments are actually being carried out on plants at the moment. It seems that it is in this way that foreign lipoids are washed out of the organism and prevented from getting fixed. The combination during the period of incubation is checked, and when the "injection déchainante" is given there is no shock. We do not go so far as to pretend that proteins play no part in anaphylaxis, but we think they are controlled and determined by soaps and lipoids. It is through the latter that mineral waters play their protective part against anaphylaxis.

ORIGIN OF MINERAL WATERS.

That mineral waters prove to be very complex substances is no surprise when you think of their origin. I am speaking merely of the plutonic waters gushing up in volcanic districts. We know that they come from very deep, for, in the search for oil in the Auvergne, shafts have been bored over 3000 feet deep, and waters have been found quite similar to Vichy water, for instance. There is no doubt that they come from a far deeper layer still. They are not surface waters absorbed and rejected, but synthetic waters from distillation of granite at a very high temperature and under extreme pressure, under the action of carbonic gas. They come from what we might call the underground melting-pot. We know nothing of the condition of matter under these conditions, but we suspect it to be a sort of sample of the concentrated primary nebula. Mineral springs are the last remnants of plutonic phenomena; in fact, miniature volcanoes. The spectroscope reveals many constituents, and there is little doubt that still more will be revealed. Geologists have no explanation to give as regards the origin of the tremendous volume of carbonic gas produced during the succession of geological epochs. In a few words: mineral water is a very complex solution of electrolytes, which has not yet found, when it reaches the surface, its normal equilibrium.

If we consider the question from the historical point of view we see that there always has been some mystery surrounding springs. There were supposed to be a sort of emanation of the divinity, and some god or goddess presided over each. A spring was a shrine. Then came the empirical period. They did not speak of the *virtues* of waters but of their *action*. Some patients got cured, told their story, and sent to the same spring those who suffered from the same ailments. And that was the beginning of the specialisation of springs. Later on the waters were studied from the chemical point of view, and it is from the analysis of the waters that the scientist tried to deduce the explanation of their origin. It was not until the present century that their physical and biological properties were taken into consideration, firstly by a young French scientist, Fleig, who died quite young, leaving us a marvellous field of research and of investigation.

Their Biochemistry.

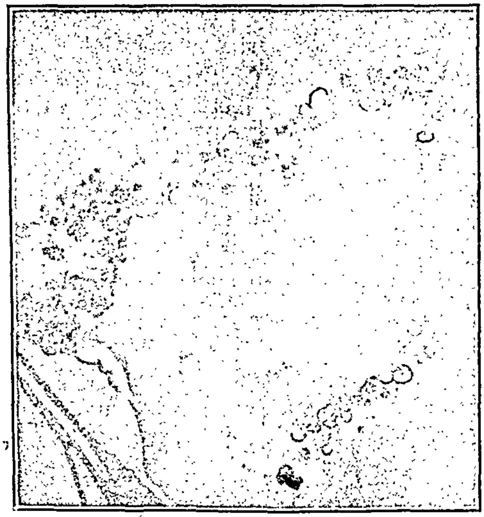
Let us now revert to the composition of mineral waters. We may take as a type the water that has been most especially studied: that of Vichy. Until lately chemists only told us about the elements which were present in large quantities, such as sodium bicarbonate and sodium sulphate. But lately Mr. Bardet, of the Institute of Hydrology in Paris, studying the composition of these waters with the spectroscope, has discovered a true secondary mineralisation, and has given us a new list of elements which were totally unsuspected. Of these we may mention lead, germanium, gallium, molybdene, copper, antimony, cobalt, mercury, nickel, gold, and thallium. As a matter of fact, this new list mentions no less than 42 elements, and there is very little doubt that when the list is completed it will include practically the whole list of the cosmic elements.

And now for the physicist. He in turn discovers quite a number of unknown properties: radioactivity, rare gases, phenomena of osmosis, of ionisation, of catalysis. He studies the colloidal equilibrium of salts, their electrical potential, and shows that they constitute a mechanical living complex, which cannot be compared with any artificial solution and which would baffle the efforts of synthesis.

Some day much more will be known about these actual problems. We may prophesy safely that the physician of to-morrow will have to be a biochemist. He will know about health and disease vibrations. He will know how to measure them and how to use them. A good deal has been done already, but the work of the pioneers has not yet reached the scientific stage when results can be given in figures by mechanical means. An example of such a device is given by Prof. Puech, when he measures the electrical exchanges between a patient in a bath and the water of the bath. He has shown that certain organisms work like a battery, taking on or letting off electric charges. This should be a guide to us in physical treatment. On the other hand, we have all heard of methods aiming at the detection of life emanations and at measuring them; but such methods failed to exclude in their measurements that personal equation which does not allow control. Yet it might happen any-

It seems to me most probable that diverticula start as true pulsion herniæ of the mucous membrane through the ridges in the circular muscle coat at the weak points where the blood-vessels enter, and that after their formation a retained fæcal content is likely to set up inflammation which spreads to the neighbouring tissues. This secondary inflammation may never occur, or it may take place at almost any stage in the development of the pouches. The nature of the process which starts the condition is at present only conjecturable, but it seems probable that some degeneration of the bowel wall, probably from age and unnatural conditions of the bowel function, is the initial factor. In favour of this view is the fact that the condition is practically confined to the second half of life and that diverticula of the colon are most frequently seen in fat persons. I have seldom seen a thin individual with diverticulitis. The rapid deposit of fat is generally a sign of poor metabolism and is usually accompanied by a marked degeneration of the musculature. It is probably this degeneration of the muscular wall of the bowel which explains the common association of excessive fat and the development of diverticula in the colon.

FIG. 4.



Radiogram of barium enema showing diverticula all along the colon, taken after evacuation of the barium from the bowel.

I have been fortunate in obtaining a specimen (Fig. 3), which shows the development of inflammation in the colon wall as a secondary result of a diverticulum at a very early stage. It will be seen that the diverticulum has pushed its way right through the muscle coat into the subperitoneal tissue and that an abscess has begun to form round its tip, probably as the result of the small foreign body present in the apex of the diverticulum. This specimen shows the very earliest stage in the development of a diverticulitis, and it is easy to realise that if this condition occurs over a large area of the colon wall it will in time produce the typical fibrous stricture that we see in cases of this type of diverticulitis.

Two Varieties of Diverticulitis.

There appear to be two very different and distinct types of case commonly seen. In the first the colon wall becomes inflamed over a fairly wide area at a very early stage in the development of the diverticula, as seen in Fig. 3. This results, in course of time, in very dense and progressive thickening and fibrosis of the colon wall in the affected area. Ultimately a firm fibrous stricture develops, with greatly thickened walls and firm adhesions to surrounding structures. This type of case from a clinical point of view closely resembles carcinoma of the colon, and is not infrequently mistaken for it. X ray photographs fail to show the condition well, as the narrowed pouches do not readily fill with barium solution. This type of case can only be treated satisfactorily by resection of the damaged area of colon, or by establishing a colostomy opening above the obstruction.

The second type is the commoner and is that in which the diverticula develop and grow, often to a considerable size, without any accompanying inflammation. Such cases are rightly called diverticulosis to distinguish them from the inflammatory type (see Fig. 4). No symptoms are present and the disorder is only potentially serious. Inflammation may eventually occur, as the result of the irritation set up by hard retained fæcal matter in one or more of the pouches, with the result that an abscess forms outside the colon or there is perforation into the general peritoneal cavity with peritonitis. Obstruction may result from adhesions, but is not so common as in the first type, and the same dense thickening and fibrosis does not occur.

Conclusions.

1. The earliest stage in the development of diverticulitis is the formation of pulsion diverticula in the colon wall due to weakness of the musculature. 2. Inflammation is always secondary and is due to foreign bodies or fæcal material getting into the diverticula. 3. The X ray appearances which have been supposed to be due to inflammation are due to very small but numerous diverticula of the mucous membrane. 4. Secondary inflammation of the pouches may occur at an early stage and produce dense fibrosis; it may not occur at all, or only very late in the development of the diverticula.

A NEW THORACOSCOPE.

BY F. G. CHANDLER, M.D. CAMB.,
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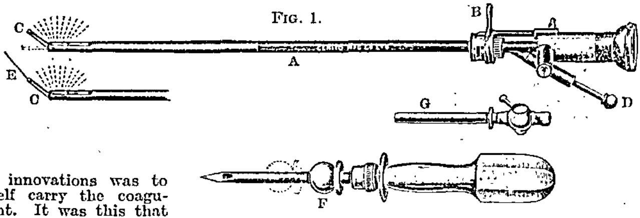
THE instrument to be described embraces new principles in thoracoscope construction. The one instrument serves the double purpose of endoscope and active electrode for cauterising; thus only one puncture is needed. It is used with a diathermy current. It is made by Mr. R. Schranz, of the Genito-Urinary Company, who has given up a great deal of time in coming to the City of London Chest Hospital to study at first hand the problems involved. We believe that we have evolved an instrument which is in certain respects an advance on previous ones, the handling of which is easy, and which very greatly facilitates the technique of severing adhesions. The original Jacobæus instrument I personally found difficult, and, judging by the number of its modifications, others have evidently had the same experience. The field of vision, at right angles to the instrument, was awkward. Moreover, two punctures were necessary. Cauterising might be long and tedious; and smoke would not infrequently obscure the view. On reading of the Davidson operating thoracoscope (New York), I tried this, and after a considerable modification of the electrode by Mr. Schranz, I found it very good; it is this instrument that inspired the work on the one to be described. There are, however, in my opinion, two or three rather strong objections to the Davidson instrument. Firstly, it is too big. The wound made is unpleasantly large. Secondly, it is oval in shape, which increases the chances of surgical emphysema as the instrument has to be rotated during use, and so opens up the tissues to the pneumothorax. Thirdly, the instrument itself has to be pushed to and fro in the chest wall during manipulation, instead of working in a cannula like the Jacobæus instrument, this again making surgical emphysema and sepsis more likely, and leaving a wide opening into the pleural cavity which needs very careful stitching afterwards.

The advantages of the new instrument may be summarised briefly as follows: 1. Its small calibre (18 Charrière gauge). 2. Its working through a cannula. 3. The need for only one puncture. 4. The excellent field of vision, which is at an angle of only 30° off the axis, thus simplifying orientation. 5. The electrode being placed just beyond the lamp it is as easy to touch as to see an adhesion. 6. It is a diathermy instrument—the current being absolutely under control of the operator by a foot-switch. With this current a suitable adhesion can be first coagulated and then cut through in a few moments, with no production of smoke. 7. The whole instrument can be boiled.

FIG. 1.



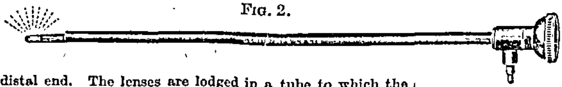
One of the principal innovations was to make the telescope itself carry the coagulating and cutting current. It was this that enabled the size of the instrument to be made reasonably small. The coagulating electrode is large, thus rendering dangerous hæmorrhage practically an impossibility. Through this large electrode is pushed, by a simple device, the cutting wire made of tungsten, which is strong and not easily bent.

Description of the Thoracoscope.

The following is a more technical description of the instrument (Fig. 1).

It consists of a metal sheath (A), 25 cm. long, covered with a special insulating compound on the outside. The distal end has a terminal and a lateral opening. At the junction of these a round bar is fixed, which acts at a pivot for the diathermy electrode. At the proximal end a revolving collar with a helical groove controls the movement and position of the telescope (B). By means of this device the movement of the telescope along the axis of the sheath imparts the requisite tilt to the hinged electrode at the distal end. The lenses are lodged in a tube to which the lamp is attached; at the junction of the lamp a prism deflects the optical axis by 30°. The lamp case carries the actual diathermy electrode which is hinged to the case (C). A fine tube runs along the telescope from the proximal end to the junction of the lamp; it then continues at the bottom of the lamp case, and emerges at the joint of the diathermy electrode with the lamp. Through this fine channel a tungsten wire passes right to the tip of the hollow diathermy electrode. The wire is controlled at the proximal end by an insulated handle (D) by means of which it can be pushed forward, beyond the diathermy electrode, to the extent of three-quarters of an inch (E), and withdrawn at will.

FIG. 2.



The cannula of the trocar with which the chest is punctured, and through which the instrument is passed, has an adjustable guard in the shape of a ball (F); this can be clamped at any distance from the end of the cannula. If, for any reason, the thoracoscope has to be temporarily withdrawn from the pleural cavity, a faucet (O) with tap is inserted into the opening of the cannula to prevent escape of air. This also allows fluid to be withdrawn or air to be introduced if needed, pressures to be taken, &c.

This instrument suffices to deal with suitable adhesions favourably located. If, however, the lung is attached to the parietal pleura by a short adhesion, or one into which lung tissue projects, great care must be exercised to sever such a structure close to the parietal pleura. For this local or general anæsthesia is probably necessary, preferably the former. For this purpose we have devised an instrument very similar in construction to the cutting thoracoscope. In this the diathermy electrode and the wire channel are replaced by a fine cannula with a hypodermic needle at the tip. Another possible use suggested for this instrument is the injection of an adhesion with lipiodol, when very considerable doubt exists of the presence of lung tissue; subsequent radiography will give the desired information. Experiments I have made with meat similarly injected suggest that if the injected adhesion is afterwards severed by diathermy no free iodine is liberated.

In addition to the instruments already described, two additional wide-angled telescopes for a preliminary examination of the pleural cavity can be used, one having the optical axis deflected at the same angle as the operating instrument (Fig. 2), the other at an angle of 90°, which would enable one to view a side of a wide adhesion inaccessible to the other telescope.

When an adhesion is located, a portion about 8 mm. long is coagulated, the diathermy electrode being applied both to the back and the front of it, if necessary. The tungsten wire is then pushed forward and applied to the centre of the coagulated section. The cutting current is now switched on, and the adhesion severed. Purely fibrous bands can be cut through in a second without previous coagulation, as there is no bleeding. A special diathermy apparatus is used for this purpose, designed by the Genito-Urinary Company, producing a coagulating (diathermy) and a cutting (endothermy) current. A selector switch is fitted on the top of the panel by means of which either one or the other type of current can be applied. The apparatus is controlled by the operator himself by a foot-switch. The strength of the current is regulated according to the size or resistance of the adhesion, and for this purpose a regulator with an empirical scale marked 0–10 is provided. The patient is connected to the other pole of the machine through an indifferent electrode—that is, a large-sized lead plate covered with a towel soaked in 10 per cent. saline solution. This is placed on the operating table and the patient lies on it, thus making good contact with his own weight.

NORTH STAFFORDSHIRE CRIPPLES' AID SOCIETY.—This society proposes to enlarge the Cripples Hospital at Hartshill, Stoke-on-Trent, at a cost of £20,000, and it is stated that the Ministry of Health regard the plans as "a model for similar institutions." The enlargements will include a new out-patient department, an operating theatre, an X ray room, and accommodation for nurses and staff. Viscountess Ednam, president of the society, points out that much of the work of an orthopædic hospital can be carried on by means of out-patient treatment, which at Hartshill, costs approximately 7*s.* per week, as compared with £2 0*s.* for in-patients.

in isolation, and further one would expect that infection in man with such an organism would result in unequivocal serological eivdence of its presence; this, however, has not been forthcoming.

We have had the opportunity to investigate 12 human cases diagnosed as psittacosis and six parrots connected with these cases; one of the human cases came to autopsy. In none of these have we been able to obtain any evidence. either bacteriological or serological, of the presence of any member of the salmonella group.

In view of our negative findings and of those contained in the literature we decided to approach the problem from a different angle. It occurred to us as possible that this disease in parrots is caused by a filtrable virus which may under favourable conditions be capable of infecting man. Using the budgerigar as our experimental animal we have been able to demonstrate the presence of a filtrable virus in the organs of a parrot which had been responsible for two human cases. The bird was ill when it reached us, and died in the course of a day or two; bacteriological examination of its tissues gave entirely negative results. Although no quantitative experiments have been carried out our findings suggest that the virus passes readily through Chamberland L1* filter candles and passage in budgerigars with filtered material has been realised. The parrot tissues are still virulent after being kept for 20 days in 50 per cent. glycerol saline in the cold.

Further experiments are being carried out along similar lines with material from other diseased parrots and also from human cases. We are not in a position to say that this virus is the cause of the disease in man, but we consider that our findings suggest that possibility. We are fully aware that the parrot is susceptible to the virus of fowl plague and that we may be dealing with this virus. Experiments designed to determine this point are being carried out.

In conclusion, we wish to express our thanks to our colleagues of the London Hospital, to the Ministry of Health, and to doctors who have kindly put us in touch with material.

HYPERVITAMINOSIS D:

CALCIUM-PHOSPHORUS INTAKE A DETERMINING FACTOR.

By Leslie J. Harris, Sc.D., Ph.D.,

DIRECTOR OF THE MEDICAL RESEARCH COUNCIL'S NUTRITIONAL LABORATORY, CAMBRIDGE.

I am prompted to write the present brief summary of observations to be published in detail later by the consideration that they may suffice to account for the failure of certain workers to reproduce consistently results which have been more readily confirmed by so many others.

Harris and Stewart[1] in 1929 found that administration of excessive vitamin D to rats and rabbits tended to give rise to hyperphosphatæmia and/or hypercalcæmia, a result since confirmed in more extended series of experiments. Since this, as well as the other effects observed, were the opposite of those seen in vitamin D deficiency we concluded: "There are low and high threshold values for vitamin D below and above which there are caused deficient and excessive values respectively of blood-phosphorus and/or blood-calcium and resulting calcification" (Harris and Moore).[2] Now in rickets the primary disturbance is apparently a lowered retention of phosphate or calcium from the gut, with consequent lowering of blood P or Ca, and a resulting deficient "calcification"; and the severity of the condition is largely dependent upon the absolute and relative amounts of these two elements provided in the diet. It was therefore suggested (Harris and Stewart)[1] that the same considerations might also be of consequence in hypervitaminosis D. My present purpose is to mention findings which confirm this idea.

In the first experiment to be described I have fed rats on "synthetic" diets containing a constant known excess of irradiated ergosterol with various graded allowances of calcium phosphate. The results show that the ill-effects produced by the excessive vitamin D (as judged by growth responses, by condition of animals, by extent of calcification and other post-mortem findings, and by histological examinations by my colleague Mr. J. R. M. Innes) are immensely accentuated by any increase of the calcium phosphate and conversely are prevented by a decrease. In another experiment it was found that rats fed on bread and milk in place of the usual "synthetic" rations developed typical hypervitaminosis provided they were given sufficient irradiated ergosterol (0·1 to 0·2 per cent.) and for a sufficient period (e.g., within 45 days). Further, by adding the usual percentage of synthetic salt mixture (rich in Ca and P) to the bread and milk employed as basal diet, these symptoms were greatly accelerated and intensified. (This last experimental result may perhaps explain the recent observation of Prof. Dixon[3] who wrote, "The same experiments made on animals living on an ordinary diet show that the excess of the 'poisonous' food is harmless. For example, certain preparations of irradiated ergosterol given to rats which are being fed on a synthetic diet act as a poison, *but if the rats are fed on bread and milk the effect of the ergosterol is negligible.* In real life we do not live on a completely synthetic diet; nearly everyone takes some if not an abundance of fresh food, so the practical value of this type of experiment may be over-estimated, though it is of considerable academical interest.")

A further point of interest is the possible effect upon the calcium (or phosphorus) retention of changes in the Ca : P ratio of the diet. We found, for example, in experiments concluded about a year ago that rats fed on the high Ca : low P "rachitogenic" diets of Steenbock or of Pappenheim rapidly developed a fatal hypervitaminosis when excessive vitamin D was added.

It is seen, in short, that the occurrence or severity of the hypervitaminosis is determined not only by the degree of vitamin D excess administered and the length of the experimental period but also by the calcium and/or phosphate content of the diet. This observation no doubt accounts for a certain amount of confusion which is evident in the literature; it is of further interest in throwing light on the mode of action of vitamin D in the animal body. It might be added that a fair number of clinical cases of hypervitaminosis (resulting from injudicious use of therapeutic preparations) have now been reported by physicians in Europe and in America, in which the main symptoms are the same as those seen in the experimental condition—viz., high blood P and Ca and excessive calcification. Bearing, too, on these findings is the observation of Miss Elsie Watchorn (in the press) that the hypervitaminosis gives rise to a greatly increased excretion of Ca by the kidney. Direct measurements of Ca and P retention are now in progress. Contrary to the suggestion of A. F. Hess (1928) we find by chemical analysis that there is no loss of Ca or P from the bones to account for the rise in the blood figure.

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[1] Harris, L. J., and Stewart, C. P.: Biochem. Jour., 1929, xxiii., 207.

[2] Harris, L. J., and Moore, T.: Ibid., p. 261.

[3] Dixon, W. E.: Nature, 1929, cxxiv., 204.

Accidents at Sheffield.—During 1929 the number of traffic accidents dealt with by the Sheffield Royal Hospital was 1152; 358 of the cases were admitted to the wards. The total number of casualties treated during the last three months of the year was 5624, as compared with 4601 in the corresponding quarter of 1928. Of the traffic casualties 75 per cent. were caused by motor-cars and motor-cycles. The 358 patients admitted to the wards spent 6710 days in hospital at an average cost per head of £6 17*s.* 5·39*d.* Of the total costs of £2460, £2199 was recovered.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF MEDICINE.

AT a meeting of this Section on Jan. 28th, with Dr. R. A. YOUNG, the President, in the chair, a paper on

PSITTACOSIS

was read by Dr. A. P. THOMSON (Birmingham). With the four cases described in a previous communication,[1] he said, the total number he had now seen was 17, of which 5 had proved fatal. As a general statement it was fairly accurate to say of the severer cases that they resembled typhoid septicæmia in retaining a relatively slow pulse despite a high continuous fever. Even before the development of the unusual pulmonary signs, however, certain features distinguished them from true typhoid: the onset was usually more sudden and the temperature rose more rapidly. Headache was intense, generally occipital in situation, and often associated with slight cervical rigidity. Epistaxis had been noted in one patient. Sweating was sometimes severe. Diarrhœa and vomiting sometimes occurred in the early stages, but as a whole, the alimentary symptoms, apart from distension, were trivial. The spleen became palpable in one case and then only for a few hours; no rose spots had been observed. In one case there had been a typhoid-like relapse. The outstanding feature of the clinical picture was the involvement of the lungs. At the onset signs of slight shifting bronchitis appeared, to be followed in a few days by those of extensive consolidation manifested by impairment of the percussion note and the presence of tubular breath sounds. Still later the percussion note became completely flat and breath sounds in the affected area disappeared. This curious silence of the lung might persist for some days after the temperature had fallen and the general condition had improved. A whole lung might be affected in this way. Resolution was very rapid and complete, and was accompanied by fine crepitant râles. Repeated exploration of the chest having shown that these signs were in no way due to pleural effusion, Dr. Thomson concluded that they were associated with obstruction of the smaller bronchi. Confirmation of this opinion was afforded by a post-mortem examination in one of the cases.

Certain negative features in the respiratory condition were important. Although cough was frequent and at times incessant it was never painful, and expectoration was scanty and often absent; only once was any rusty sputum obtained. Respiration was not hurried unless the area of lung involved was very extensive; it was easy and never "pneumonic" in character. Pleuritic friction was never found. Some of the patients had conspicuous nervous signs. Although the clinical course of most of the cases formed a fairly characteristic picture it was clear from a review of the whole of them that the symptoms and signs might be but slight and equivocal—even when the disease proved fatal—and a diagnosis would be frankly impossible unless the history of contact with sick birds was elicited.

Bacteriological Aspect.

The bacteriological findings, said Dr. Thomson, were as yet incomplete, and it would be unprofitable to review them at length. In the earlier part of the investigations a review of such literature as was available had led him and his colleagues to concentrate attention on the discovery of an organism of the typhoid or salmonella type. In the first case a bacillus corresponding fairly well with this group was recovered from a local parotid swelling but in none of the subsequent cases had there been any success so far. A remarkable feature was the recovery of an organism similar in its sugar reactions to *Bacillus fæcalis alkaligenes* from the lung in three cases, and also from the love-bird responsible for the infection of two other cases. Whether or not this organism was responsible in any way for human infection was a problem still under investigation. The results of the agglutination tests were extremely irregular and capricious. In two cases positive agglutination to a typhoid organism were obtained but in nine others there was none. Not much reliance could be placed on positive agglutination with *B. psittacosis* or the salmonella group generally as a means of exact diagnosis, particularly when, as in this series, they were often so transient and variable.

Discussion.

Dr. ROBERT HUTCHISON said he was genuinely grateful to Dr. Thomson for his patient work on this subject, for had it not been for that he would not have recognised the nature of the first case of the kind which came to him in London, since which date he had had considerable experience of the disease. The paper he referred to was Dr. Thomson's contribution to a meeting of the Association of Physicians last spring. Since then he, the speaker, had been in touch with over 20 cases of the kind; four were at present in London Hospital. In the 22 cases there had been, so far, two deaths. The instances of the disease had been enthusiastically investigated by Dr. Levy Simpson at London Hospital. The cases had mostly occurred in house outbreaks—i.e., two to four cases occurring in one family; there had always been a parrot, usually the Amazon green variety. He did not agree with the statement that psittacosis was only found in green parrots; in this series one was a grey parrot. In most of the 22 cases the infection appeared to have been directly from bird to human patient; in one case the patient had not been in close contact with the parrot in question, but she had been in close communication with a sister who had, and had used the same handkerchief. She was now recovering in London Hospital. Apparently the incubation period was about ten days. It was the same condition as occurred in France, where it received the not inappropriate name "pneumotyphus." When patients were seen the condition looked as if it ought to be typhoid or paratyphoid. In none of his cases was there found the hard dense consolidation of the lung which Dr. Thomson described. In most of the speaker's cases there was an impaired note and medium moist sounds. One patient—who died—had pleurisy, and at the autopsy a condition of pneumonia was described as present. Prof. Turnbull said it was unlike any ordinary pneumonia, either croupous or bronchial. Dr. Hutchison agreed with Dr. Thomson that the diagnosis of psittacosis must always be circumstantial at the moment—the fact of the disease occurring in a house which harboured a sick parrot. At present the bacteriology was vague and indeterminate. There was a good deal of psittacosis at present in London; in response to a letter from himself in the medical journals he was told of four additional cases, and probably cases were being overlooked. Last July a bad outbreak of the disease took place in the Argentine Republic, whence many of the birds had been brought to Europe, but a knowledge that such an epidemic occurred had only slowly filtered across the Atlantic. No cure had been found for the fully developed disease. In Germany the importation of parrots had been forbidden; England was attempting to protect herself by imposing quarantine on these birds. To be effective it seemed that this period of quarantine must be a prolonged one. Perhaps the Ministry of Health would investigate the matter.

Dr. E. STOLKIND spoke of two patients under his care whose symptoms pointed to psittacosis, though both made a complete recovery. He found in one case that the parrot being kept in the room was obviously ill, and he ordered its removal, but this was method) the use of platinum needles with an over-all length of 22·5 mm., each containing 5 mg. of radium, buried them at such distances apart as, it was hoped, would produce homogeneous irradiation of the growth. At first the radium was left in place for 24 hours, and then subsequently for 36 hours, at a time, because the resistance of the malignant cell to irradiation increased if its nucleus was not destroyed at the beginning of the treatment. The complications in this method were difficulty in micturition, caused by œdema of the urethral mucous membrane, sloughing—the result of over-dosage—and stricture of the external meatus. Opinions differed about the treatment of inguinal lymphatic glands; he himself did not operate upon these nor irradiate them unless the skin over them had ulcerated, for if the squamous cells of a penile cancer had entered the inguinal glands they would not go any further, while if the primary growth had been irradiated, these cells would not multiply, but would be ringed round by a defensive fibrosis. By irradiation the penis was preserved, and though stricture of the external meatus might sometimes result, its frequency was not comparable to that observed after amputation.

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[1] THE LANCET, 1929, ii., 115.

Mr. Morson's conclusions were briefly as follows. In both papillomatous and ulcerative varieties of penile cancer the growth could be made to disappear, but there was no guarantee of cure. The moral effect of removing the tumour while retaining the penis rendered irradiation the method of choice. Recurrence could be met by further irradiation and health could be so much improved that the patient could stand a Pearce-Gould operation if necessary. If most of the penis had already been destroyed, total amputation was the correct treatment.

Discussion.

The **President** said he had not treated carcinoma of the penis with radium, but he agreed that the psychological effect of retaining the penis was important. He hoped Mr. Morson's statement that epithelial carcinoma was stopped by the glands was true.

Mr. **F. Fowler Ward** (Ipswich) said that on looking up his cases of cancer of the penis in the last ten years he found in none of them had the growth recurred. One patient had died of what appeared to be a secondary effect in the lung. The only immediate fatality he had had was one in which the femoral vein was torn, death following from hæmorrhage in 30 minutes. He was much impressed by what Mr. Morson had said about the use of radium in these cases.

Mr. **Eric Pearce-Gould** considered that in the future there would be no need to inflict on patients the full horrors of the radical operation. His last case was treated with radium, and the result was very satisfactory.

Mr. **Frank Kidd** discouraged belief in a cure of these cases by radium. In performing the Pearce-Gould operation he had never had difficulty with sepsis, nor was there stricture of the urethra. He was not aware of his patients having had inferiority complexes; they seemed happy and comfortable. A much longer period should elapse than Mr. Morson had mentioned before speaking of cures by radium.

Mr. **R. H. Jocelyn Swan** did not think Mr. Morson claimed to have brought about cures, but he indicated the progress which had been made in treatment. He objected to Mr. Morson's statement that the cells having got to the inguinal glands they went no further; he could produce evidence to the contrary. He would prefer to use a small dose of radium over a longer period than a larger dose for a short time, and he would concentrate the irradiation as a barrage at the growing edge. The epithelial type of new growth was well fitted for treatment by radium.

Mr. **H. W. S. Wright** spoke of the prevalence of penile cancer and warts and phimosis in China. Most of the cases of cancer of the penis which he saw there were of the cauliflower type. He treated them by an operation approximating to that of Pearce-Gould. He had only one death, and that was due to septicæmia.

Mr. **Morson**, in his reply, said he had seen a considerable number of cases of carcinoma of the penis in which the primary lesion was in the prostate, and in most of the cases where metastases were found, other than in the inguinal glands, the primary lesion was in the prostate, not in the penis.

MEDICAL SOCIETY OF LONDON.

At a meeting of this Society on Jan. 27th, with Mr. **Donald Armour**, the President, in the chair, a paper on the

Ætiology of Gall-bladder Infections

was read by Prof. D. P. D. **Wilkie** (Edinburgh). To some it might seem presumptuous, he said, for a surgeon to enter on discussion of this subject, but present-day knowledge of the gall-bladder was largely due to the observations of surgeons. So commonly was this organ diseased, and so often were stones present in it, that the pathologist was apt to discount its importance, while post-mortem changes took place in it so rapidly that early lesions might readily be missed. Numbers of patients were operated upon because they had had a chronic flatulent dyspepsia associated with some ill-health—apart altogether from biliary colic—and in many of these cases, although there were no stones in the gall-bladder, there was a definite change in its wall. Cholecystectomy had been found to give relief, not only to the flatulent dyspepsia, but also to other symptoms, and gradually the idea had been evolved that the gall-bladder might not only be the seat of inflammation, causing local symptoms, and of stone formation, causing colic, but that it might also be a focus of infection affecting other parts of the body.

The gall-bladder was a concentrating organ; it concentrated bile ten times in the course of 24 hours, both the pigment and the salts. And the important question arose whether it possessed the power of spontaneous contraction, and whether it could empty itself by means of its own musculature. Prof. Wilkie thought it could. Ivy, of Chicago, had shown that from the upper part of the small intestine one could isolate a gall-bladder hormone, a purified secretin, which, when injected intravenously into animals, caused the gall-bladder to contract.

Cholecystitis and Gall-stones.

What was the origin of cholecystitis? Did it always precede gall-stones, or did gall-stones precede it? There was a good deal of evidence that certain types of stone might form independently of any infection, and particularly the pure radiate cholesterol stone, which was usually single, ovoid, opalescent, and was found in a gall-bladder which was not thickened and was unassociated with a history of previous febrile attacks. Sometimes this received the name of "metabolic" stone, as it was supposed to be laid down because there was an excess of cholesterol in the bile and some stasis in the gall-bladder. It produced an afebrile colic which was intermittent, and inaugural symptoms due to cholecystitis were absent. At any time such a stone might be impacted in the neck of the gall-bladder and cause an attack of biliary colic. In such an event the gall-bladder filled with mucus. The stone might remain impacted and leave the patient with a mucocele of the gall-bladder, or it might fall back again as the tension diminished. The pure pigment stone was not often seen, but was typically associated with acholuric jaundice; it was not associated with cholecystitis, even at a later stage. The septic, faceted stone, which had a cholesterol centre and laminæ of cholesterol and calcium, might appear secondarily to a primary stone, or might form independently.

Primary infection of the gall-bladder, went on Prof. Wilkie, was undoubtedly very common; Graham, of St. Louis, thought that 35 per cent. of the adult population had some degree of infection of the organ.

The route by which bacteria reached the gall-bladder had been much in dispute. Many were taught that infection travelled from the duodenum, up the bile-duct, and so to the gall-bladder, duodenal catarrh being a predisposing factor. Some thought it came down from the liver in the bile stream, but most of the evidence was against this suggestion; if 40 c.cm. of an emulsion of *Bacillus coli* was injected into the portal vein of an animal, it could not be recovered from the gall-bladder on the following day. It was, as a matter of fact, difficult to infect, from the lumen, any hollow viscus which had undamaged mucous lining. Graham brought forward strong reasons for thinking that infection travelled from the liver to the gall-bladder, and that hepatitis preceded the cholecystitis, but there was now evidence that this was not the usual route of infection. At one time it was thought that typhoid infection was the most potent cause of cholecystitis, and it was true that typhoid did infect the gall-bladder, and that a patient might have a chronic typhoid cholecystitis for many years. That was not the common type, however, in Prof. Wilkie's opinion. In his own series of 650 cases—almost all of which had been examined bacteriologically—there had not been a single one of typhoid infection. Both colon and typhoid bacilli could flourish in bile, and from many infected gall-bladders the former could be recovered. What struck him and his colleagues most in examining gall-bladders was the number of cases in which there was neither a growth of organisms in culture nor the ability to demonstrate them in microscopical sections. Extending the series, a number of cases were found in which chains of micro-organisms were demonstrated, though culture from the gall-bladder wall was sterile. The work had been continued during the last 3½ years, and the results had been fairly consistent; they had been able to grow a streptococcus from 32 per cent. of the cases, and *B. coli* in 14 per cent. It was safe to say that just over half these gall-bladders gave a positive growth of streptococcus. Success in this work began when only a small piece was taken for culture, avoiding the mucous membrane, and particularly when the cystic lymph gland was used. Even then, however, the result was negative, unless the gland was removed at the end of 4 to 6 hours. For the organism would not grow if there were autolytic products, or if there was much bile in the medium.

Prof. Wilkie showed the following Table which showed, he said, remarkable difference in the incidence of hospital and private cases.

Gall-bladder Cases, 1919–29.

—	M.	Av. age.	F.	Av. age.	Total.	Av. age.
Hospital ..	61	48	298	46	359	46·5
Private ..	92	56	207	51	299	53
Total ..	153	—	505	—	658	—

M = male; F = female; av. = average.

Operations.

—	Ch.	Died.	St.	Died.	Per cent. mortality.	
Hospital ..	266	6	59	1	2·1	2·73 av.
Private ..	186	6	86	5	4·04	

Ch. = cholecystectomy. St. = cholecystostomy.

Medical and Surgical Treatment.

The investigation, he said, had altered his conception of cholecystitis, for he believed it was, in the majority of cases, a blood-borne intramural infection of the gall-bladder, and therefore difficult to eradicate. The only medical means of doing so seemed to be to raise the general resistance of the patient to the organism, or if possible, to give some drug which was absorbed by the gall-bladder; the surgical alternative was to remove the infected organ in which streptococci had become located. This knowledge meant that the operation of choice was not drainage of the gall-bladder, but removal of its infected wall. A criticism sometimes heard was that people were not well after their gall-bladder had been removed, and he knew of several people who complained of symptoms after cholecystectomy. But where such cases had been investigated properly, and especially if they had been operated upon again, some cause had been found for the residual symptoms: a stone previously unnoticed had been left behind, or there was pancreatitis, or a coincident ulcer had been missed, or appendicitis, or even unrecognised malignant disease in the colon. Could one hope, by ordinary drugs, to affect beneficially a lesion which was intramural? Prof. Wilkie still was doubtful about that. When secondary infection of the colon was present considerable benefit could be got by medical biliary drainage or by giving certain drugs, such as urotropine; but for the chronic indolent type of streptococcal intramural infection very little could reasonably be expected from drugs, and if the condition was persistent and disabling, operation was the only rational treatment.

Discussion.

IN seconding a vote of thanks proposed by Mr. V. WARREN LOW, Mr. HERBERT CARSON remarked that this recent work left no alternative to the conclusion that at present the right treatment of chronic cholecystitis was surgical.

Mr. A. J. WALTON said his own experience of this subject had been mainly clinical, but it largely accorded with what Prof. Wilkie had established from the pathological side. He thought the cholesterol gall-stone was always due to inflammatory change. He had found that the pure cholesterol stone was always single and relatively small and amorphous in its outer layers. If Aschoff had been correct, cholesterol stones would have been found as a crystalline formation. He agreed with Bland-Sutton that crystallisation was always a secondary change. He, the speaker, had had 23 cases in which there were pure cholesterol stones; 5 of them had acute, and 18 chronic, cholecystitis. He had not seen such a stone in any case in which there was no evidence of cholecystitis. In his opinion Prof. Wilkie was right in thinking that gall-bladder infection was always blood borne. The gall-bladder lesion was the residue of a mild septicæmia. Many cases came with inaugural symptoms which were those of a general infection; they came to hospital with what was called influenza or pyrexial conditions, with pain. They were treated, but began to develop dyspeptic symptoms, and later they had tenderness over the gall-bladder passing on, perhaps, to cholecystitis. If left alone, the case became one of gall-bladder trouble.

Dr. J. W. MCNEE said his work made him believe that cholesterol stones occurred in gall-bladders which were not infected, and whose walls were not infected. Recently he had had the opportunity of testing Prof. Wilkie's conclusions on the bacteriology of the gall-bladder, and in most of the cases he had examined the gall-bladder contents were sterile. He had not, however, been able to examine the bacteriology of the gall-bladder wall, like Prof. Wilkie. What could be done from the medical standpoint to prevent to some extent the formation of gall-stones in cases of chronic cholecystitis was to use simple duodenal drainage, or to give concentrated magnesium carbonate by mouth in the early morning so as almost to empty the gall-bladder. The normal means of emptying the gall-bladder was the introduction of fat through the pylorus into the duodenum. Though he had seen many operations in this region, he had never seen a gall-bladder completely empty. He was sure that there were a fair number of cases of chronic typhoid and paratyphoid infection of the gall-bladder going about. A pure culture of typhoid bacilli might be obtained at operation twenty years after the initial infection. From the point of view of the physician, if the commonest variety of chronic cholecystitis was due to an intramural infection, he did not see how it could be expected to be curable by medical means, except by increasing the patient's resistance. But much could be done in preventing gall-stones, either by biliary drainage—which was more simple than many imagined—or by the use of such a tube as he passed round for inspection.

Dr. H. W. Crowe said he was glad to hear that Prof. Wilkie and his collaborators had succeeded in growing streptococci from the wall of the gall-bladder in these cases, also from the cystic duct; he had often tried himself, but without success. A woman patient of his with rheumatoid arthritis developed a very acute gall-stone colic, and when he examined her fæces after giving magnesium sulphate he found an almost pure culture of streptococcus. It was the kind which almost always caused rheumatoid arthritis in the rabbit, and it attacked the marrow of the bones more than the articular ends.

Prof. Wilkie, in reply, said he was inclined to agree with Mr. Walton that the cholecystitis was a residuum of a general infection, what could be called a septicæmia. The only occasion on which he had seen a completely empty gall-bladder was in a patient who had a tumour at the junction of the two hepatic ducts. In five cases he had found *B. welchii;* three were acute cholecystitis cases of the gangrenous type, and they had the marked pallor seen during the war in patients suffering from gas gangrene. He had not found arthritis in the rabbits studied in the series. A careful study of tonsils revealed a large number harbouring *Streptococcus viridans*, and when this was injected into rabbits it caused definite cholecystitis in three.

LONDON CLINICAL SOCIETY.

At a meeting of this Society held at the London Temperance Hospital on Jan. 28th the chair was taken by Mr. Herbert Paterson, and Dr. Arthur Hurst opened a discussion on the

Treatment of Gastric Ulcer.

Medical treatment was, he said, handicapped at the start by tardy diagnosis. The average duration of the symptoms before treatment was about ten years. Better and earlier diagnosis depended upon the general practitioner. Indigestion that did not disappear rapidly on the application of simple measures was probably due to organic disease; if the nature of this disease was in doubt, the general practitioner should seek the help of a first-class radiologist. No gastric or duodenal ulcer would escape a radiologist with the necessary experience. Since X rays did not distinguish between an active and a healed duodenal ulcer, a biochemist should be requested to examine the stools for occult blood. A test-meal was a good auxiliary, but of less importance. Dr. Hurst believed that the pathogenesis of peptic ulcers lay in a diathesis; cases with many ulcers in the family history were the most difficult to deal with. The essential factor was the presence of free acid. Ten per cent. of all persons were born with a tendency to hyperchlorhydria, and the site of the ulcer depended upon the anatomy of the digestive organs. The exciting cause might be infection, most commonly from the mouth and less commonly from the throat, gall-bladder, and appendix. Of accessory exciting causes, especially of duodenal ulcers, the commonest was smoking, which increased the tendency to hyperchlorhydria; others were indigestible food and alcohol.

Though medical and surgical treatment were not opposed, surgical treatment was only indicated in perforation and permanent mechanical obstruction. In the absence of these conditions, medical treatment, if sufficiently strenuous and prolonged, would always cure even the largest ulcer, but patients should be prepared for a stay in bed of not less than four weeks and possibly of eight weeks. No measures should be relaxed until all spontaneous pain, tenderness, and rigidity had gone; until the most delicate test failed to detect occult blood in the stools, and until the X rays showed no signs of a crater. This criterion required at least four weeks, and an extra week should be allowed for safety. The second most important principle was to remove all septic foci; this demanded the help of the appropriate specialists. Finally, the patient must continue to observe the precautionary rules for the rest of his life.

Medical Treatment.

The basic principles of the method employed by Dr. Hurst were, he said, the avoidance of free acid and of mechanical irritation. The best means of avoiding free acid was to give hourly feeds of five ounces of milk or its equivalent through a tube; change of diet was introduced to avoid monotony. Drugs were of two classes: those which prevented the secretion of acid, such as olive oil, and those which neutralised it when formed, such as atropine; the latter was very valuable and was given in commencing doses of gr. 1/200, increasing to correspond with tolerance. Dr. Hurst's views on alkalis, he said, were unorthodox. Bismuth carbonate was not an alkali; sodium bicarbonate gave off carbon dioxide and caused undesirable distension, and, if given in excess, provided a most powerful stimulus to gastric secretion. He used sodium citrate, which also prevented milk from clotting; oxide of manganese, the dose of which could be regulated to keep the patient's bowels open; and the tribasic phosphate of calcium or magnesium—chiefly the former—which effectually prevented acidosis.

Cases with a certain amount of pyloric obstruction only required operation if the condition persisted after a fortnight's treatment. In addition to the routine, the stomach was emptied last thing at night; it was always found to be empty next morning. Even if operation were required, the treatment much improved the prospects of success by restoring the tone of the stomach. There was no danger of any ulcer becoming malignant except the rare prepyloric class; these should always be treated surgically.

Surgical Treatment.

Mr. H. S. Souttar agreed on the propriety of medical treatment in every case which was diagnosed when it should be, but said that few were. He quoted the statistics of surgical results published by the British Medical Association to show that 90 per cent. of cases were virtual cures; similar success had, he said, been achieved by Lord Moynihan, the Mayo brothers, Mr. A. J. Walton, Mr. Paterson, and himself. Operative treatment was no longer as serious a matter as it had been. A duodenal ulcer or a gastric ulcer in the neighbourhood of the pylorus was relatively easily dealt with by gastro-duodenostomy; for large ulcers involving the pancreas he relied on partial gastrectomy. Technique had been revolutionised by the introduction of local anæsthesia. He infiltrated the rectus sheath, made a mid-line incision, and injected the peritoneum on each side; then he raised the liver, passed the needle back into the retroperitoneal space and flooded the splanchnic area with about 60 c.cm. of ½ per cent. novocain. These injections took about four minutes and saved a great deal of time, and the patient was completely protected against any shock. Long and difficult operations for jejunal ulcer could be carried out entirely under local anæsthesia, and the patients escaped the usual after-effects. The economic advantage was heavily on the side of surgery, because the patient could go into the country a fortnight after gastro-enterostomy for duodenal ulcer and be back at work far sooner than if he had relied on medical treatment. Moreover, after about three months' moderately careful dieting he could, within any sort of reason, do what he liked. If a patient had to remain on diet for longer than that time, Mr. Souttar did not regard him as cured, and the real test between the physicians and the surgeons was what each meant by cure. There could be no doubt which was the most convenient method. The patient who had ample time and could afford to go in for careful dieting could allow himself the luxury of medical treatment, but the patient who realised that he had only one life and wanted to live it would prefer surgery.

Dr. ADOLPHE ABRAHAMS adduced against surgery the deplorable results of failure, which occurred even in the hands of the most capable surgeons. Surgery had the advantage when time was the most important factor, but could not cure the diathesis and therefore could not guarantee a cure.

Duodenal Feeding.

Dr. ERNEST YOUNG described Einhorn's method of duodenal feeding, which had now attained wide recognition in this country. A fine rubber tube was passed into the duodenum and retained for an average time of three weeks. The patient was fed every two hours. The keynote of the treatment was rest; the stomach was spared work and no food passed over the surface of the ulcer. The tube was easy to insert if it were simply passed into the stomach up to the 23 cm. mark, and the patient told to swallow it every ten minutes. The standard feed was an egg in 8 oz. of milk and 1 of lactose, but Dr. Young varied it with 8 oz. of Benger's Food and a teaspoonful of cream. Patients tended to gain in weight. The tube caused no discomfort after the second day at longest, and the pain of a gastric ulcer ceased after the first day. The pain felt in certain cases of duodenal ulcer was relieved by a dose of alkali after each feed for a few days. Liquid aperients were given when necessary, and severe anæmia was treated with injections of iron and arsenic. Patients were allowed to get up for toilet purposes and baths and when their beds were made, and there was little weakness after the three weeks. When the tube was removed a carefully graduated solid diet was commenced. The method was suitable for all cases of gastric ulcer except hour-glass stomach and those in which the X ray revealed pyloric obstruction. Duodenal ulcer took longer to cure by this means than by surgery, but the patient with even a large gastric ulcer could be back at work in five weeks. In after-treatment Dr. Young held a middle course between Dr. Hurst's views and Mr. Souttar's, putting his patients upon a carefully chosen but full diet.

Mr. W. H. A. DODD asked Dr. Hurst the correct treatment for perforation; whether after suture his normal régime was followed. He also inquired if any technique existed for passing a stomach tube painlessly.

Dr. JOHN REID confirmed from his practical experience the value of Einhorn's method. Of 25 cases treated, 24 were employed at active work after two years; none of them were people who could study their diet, and he regarded them as cured. The average increase in weight during the three weeks was 7 lb. A strong point in favour of the duodenal tube was that, if a second tube were kept in the stomach and the food introduced very slowly into the duodenum, the gastric secretion and acidity were steadily reduced, and after a fortnight it was practically impossible to obtain any free hydrochloric acid. He believed in withholding solids for a few days after the removal of the tube, and then introducing them gradually. He did not think that recovered patients could eat anything and everything, and warned them to "gang wary" and do everything they could to prevent recurrence of their ulcer.

Dr. J. J. SPIRA said that neither line of treatment was based upon the ætiology, which was unknown. Some cases with no hyperchlorhydria did well on alkalis, which must therefore have some other action besides that of neutralisation. Experiments showed that ulcers could be caused by innumerable agencies. He asked whether the chronic and the acute ulcers were identical. The high incidence, according to Dr. Hurst, could not be entirely due to a constitutional factor, but some factor must exist which turned an acute ulcer into a chronic one. Acute ulcers, with their sudden onset and virulent course, showed all the signs of a toxic or acute infective cause and of a systemic origin; chronic ulcers submitted to the usual evolution of chronic inflammatory processes and depended upon some unknown source of local irritation which was not due to hydrochloric acid nor to the ulcer itself. Research along these lines might reveal the factor which produced chronicity.

Dr. P. FOWLIE asked the correct treatment of jejunal ulceration following gastro-enterostomy. He deprecated any further surgical intervention. While admitting that alcohol had been used in the laboratory to cause ulcer, he inquired whether as a matter of experience it produced hyperchlorhydria in man.

Dr. H. H. SANGUINETTI asked what the comparative mortality was likely to be in the two methods. Until he was sure that there were enough surgeons to perform gastrectomy in all the cases that required it, he should prefer his patients to undergo gastro-jejunostomy, and he welcomed medical treatment for a large number of gastric ulcer cases.

Dr. MARIE CASSIDY said that she had long given up bismuth in favour of magnesia.

Dr. SYBIL EASTWOOD'S experience had shown her, she said, that ulcer in the lesser curvature of the stomach was generally very easy to cure by medical means. Duodenal and pyloric ulcers, on the other hand, though they could also be cured in this way, had a much greater tendency to relapse, and the patients were generally young people in robust health, who did a full day's work and found it more difficult to keep to a diet after treatment. From the psychological point of view, she suggested, it might be better to treat them by gastro-enterostomy when one course of medical treatment had been followed by a recurrence.

The CHAIRMAN, commenting on Dr. Hurst's statement that it was impossible to diagnose gastric ulcer without X rays, remarked that it was sometimes impossible to diagnose them with X rays. Moreover, it was possible with X rays to diagnose ulcers which were not there. The method could not be trusted to detect organic disease. Prepyloric ulcers—which he called duodenal—were sometimes malignant; it was difficult at operation to say whether they were malignant or not, but they were generally irremovable in any case. He advised the recovered patient to take no chances with his diet. Gastro-jejunostomy would, he said, cure even a large ulcer on the stomach. His figures for cure were also 90 per cent., but only a small proportion of the failures had been due to surgery. Four per cent. had died of intercurrent disease, and the jejunal ulcers were entirely the fault of the patients themselves.

Reply.

Dr. HURST said that the British Medical Association's statistics were full of fallacies. The answers had been obtained from 85 experienced surgeons for periods of four to nine years. If the results had been taken for the first nine years of each surgeon's career instead of the last, the mortality-rate would have amounted to at least 10 per cent. instead of 5, and this figure might be taken to represent the real mortality. The risk was too big to run willingly. The medical mortality-rate, on the other hand, was negligible. The gastro-jejunal colic fistula which sometimes resulted from operation for jejunal ulcer was a dreadful disaster, and many patients had to undergo repeated operations. Again, only 60 per cent. of the patients had replied to the questionaire; the remaining 40 presumably included the dead and a larger proportion of the unfit than the 60 per cent. Gastro-jejunostomy gave good results in cases of simple ulcer, but these were just the cases which did best on medical treatment, and those which would not respond to medical treatment would not respond to surgical. The original homes of this operation—Leeds and the Mayo Clinic—had, moreover, abandoned it. Bismuth and soda would mask the symptoms in a large number of cases, and had been the chief means of delaying the recognition of duodenal ulcer in London until about 1904. Alcohol between meals, as in cocktails, was absolutely disastrous, but weak whiskey and soda or light wine with a meal, if the patient had been well for some time, presented little danger.

Mr. SOUTTAR also replied.

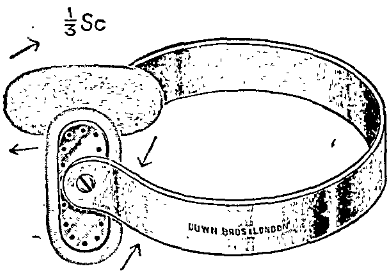
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE: ÆTIOLOGY OF YELLOW FEVER.—In our report of the discussion following Prof. Kuczynski's lecture (THE LANCET, Jan. 25th, p. 187), Prof. Ledingham's statement "Diphtheroids . . . incubation" should read: "Diphtheroids, though rare as pathogens, were widely distributed organisms, and the occurrence of apparently saprophytic forms in healthy tissues had given considerable trouble in the interpretation of growths from virus-containing organs especially after long incubation"; and the sentence "To take one example . . . visible" should read: "To take one example, the organism of pleuro-pneumonia of cattle could be cultivated in purely artificial media with formation of colonies. Yet the virus-bodies which composed these colonies still remained, though microscopically visible, incapable of very accurate resolution."

Dr. Arkwright said: . . . He understood that, in the case of typhus, cultures which began as cocci were believed to change into something which, if it was not exactly . . . At the same time proteus and rickettsia appeared both to have a fundamental relationship to typhus fever. If the change from one to the other really took place somewhere, it was perhaps begging the question to criticise the change which was alleged to occur in vitro. It was necessary, however, for the observer to take care that his faith in the unity of the two types of organism did not carry him away into accepting . . .

New Inventions.

A NEW VARICOSE VEIN CLIP.

THE spring clip shown in the accompanying illustration has been designed to take the place of an assistant in the operation of varicose vein injection. It consists of two padded metal plates connected by a horseshoe spring which when applied over the site of an injection exerts sufficient pressure to prevent circulation through the vein while subsequent punctures are being made in other parts of the limb.

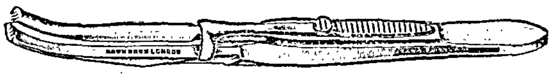


The instrument has been made for me by Messrs. Down Bros., Ltd., 21 and 23, St. Thomas's-street, London, S.E.

R. DAVIES-COLLEY, M.Chir. Camb., F.R.C.S. Eng.

NEW TONSIL-HOLDING FORCEPS.

THE advantages of the instrument, here illustrated, over others I have personally used are as follows: 1. The sliding, detachable, fastener prevents the teeth from biting through the tissue of the tonsil as by means of it one can judge the exact amount of pressure necessary to obtain a sufficient hold. 2. It never slips or tears away, it holds but does not bite through. 3. Made of stainless steel, it is solidly built, has strength to stand hard work and can be taken apart for cleaning. I have found it highly satisfactory in every way and can thoroughly recommend it.



The instrument is made by Messrs. Down Bros., St. Thomas's-street, London, S.E.

GEORGE VARIAN, M.D., B.Ch.

Reviews and Notices of Books.

MINOR SURGERY.

By FREDERICK CHRISTOPHER, M.D., F.A.C.S., Associate in Surgery at Northwestern University Medical School; Attending Surgeon, Evanston Hospital, Illinois. London: W. B. Saunders Company. 1929. With 465 illustrations. Pp. 694. 36s.

SEVERAL volumes on Minor Surgery have recently been published in England and it is therefore interesting to compare them with the latest views on the subject from America. This is a very good book. Its arrangement follows the usual lines except for the welcome addition of a long chapter designed for "The Surgical Intern." This is full of sound advice which may be read with profit, not only by the house surgeon, but also by his chief, and is mostly applicable to residents in our own hospitals. We do not, however, recommend the house surgeon in a London hospital to act on the suggestion that "it is generally desirable to address as many nurses as possible by their names."

The first chapters deal respectively with closed wounds, open wounds, foreign bodies, furuncles and carbuncles, burns, injuries by electricity, circulatory disturbances, and gangrene, while the rest of the book deals with injuries, infections, tumours, and deformities of the different regions of the body. Overlapping has been avoided with skill; "tennis leg" alone seems to be considered—and very well considered—under strains and also under injuries of the lower extremity. It is noteworthy that Dr. Christopher, when discussing antiseptics, everywhere ranks mercurochrome and iodine together, and even states that iodine has been given up as a first-aid dressing on a big railway system on the ground that it gets stale and if applied repeatedly may cause severe burns. He also reiterates most emphatically the doctrine that carbolic should never be used. If he is correct in this, most English general practitioners are steeped in heresy. The American idea of a fomentation seems to differ greatly from our own; here it is described as a large quantity of gauze soaked in warm, not hot, boric solution, and kept warm by an electric pad. In our experience electric pads are apt to produce burns.

Particularly good sections are those on the suture of wounds of face, in which Dr. Christopher is a strong advocate of closure by narrow bridges of adhesive plaster where possible; on the removal of foreign bodies, which removal he rightly emphasises should not be undertaken lightly; on breast tumours and their treatment; on the treatment of tattoo marks; and on local anæsthesia. The chapter on infections of the hand follows the lines laid down by Kanavel, who also contributes a foreword. The treatment of ganglions here advocated is rupture rather than incision. We cannot believe that the ideal treatment of a bromide rash is by intravenous injection of saline. The book is admirably printed on excellent paper and the illustrations are superb. There are few misprints and the English is excellent. The consulting surgeon and the practitioner will find much to interest them, while the house surgeon will find it invaluable.

INFLUENZA.

Etiologie et prophylaxie de la grippe. By R. DUJARRIC DE LA RIVIÈRE. Paris: Masson et Cie. 1929. Pp. 105 and plates. Fr.32.

THE writer of this monograph believes that, of the number of infective agents which have been considered as causes of influenza, only three merit serious consideration—viz., Pfeiffer's bacillus, the influenza filterable virus, and *B. pneumosintes.* Concerning the pneumococcus and streptococcus he has little to say; they are, in the words of Nicolle, "microbes de sortie"; they are found during the illness and are present in complications, but they are not the cause of the clinical disease. Most attention is given to Pfeiffer's bacillus. The chapter dealing with this organism constitutes, in fact, rather more than half the book, and is an excellent account of the life-history of the organism. The author leaves us with the impression that he considers it the most important of the three claimants to causation which he cites. The other two are, of course, more recent pretenders and there is less to be said, at the moment, for or against them. On the question of prophylaxis the author has progressive views. In addition to provision of hospital accommodation, isolation and immunological remedies such as vaccines during an attack, he advocates mobile laboratories for use during epidemics and more stringent regulations at the frontiers concerning quarantine to prevent the march of pandemics across the world.

The book is chiefly of value for its excellent account of Pfeiffer's bacillus. It is lucidly written and has a short bibliography. There are also numerous good photographs.

PHYSIOTHERAPY IN GENERAL PRACTICE.

Second edition. By E. BELLIS CLAYTON, M.B., B.Ch. Cantab., Director of the Physiotherapeutic Department, King's College Hospital, London. London: Baillière, Tindall and Cox. Pp. 231. 12*s.* 6*d.*

IN this edition over 50 pages have been added and some of the sections have been rewritten, notably those on scoliosis and fibrositis. The added matter is mainly concerned with a survey of treatment by ultra-violet light and various electrical currents. Dr. Clayton has not made any attempt to deal with the new material in detail, and those who wish to carry out his teaching in practice will have to refer elsewhere for detailed information about technique. There are now few points which do not find a place in this book, and the practitioner will find it a reliable guide when he wishes to superintend the conduct of a case under a masseur. The general impression given by Dr. Clayton's views is that they err on the side of caution. Little space is given to what is now commonly known as "manipulative" treatment, an omission that will need rectification in future editions as it is daily assuming a more prominent place in medical practice. The book is well produced.

RADIOLOGY OF THE NORMAL INFANT CHEST.

Das Thoraxröntgenbild des normalen Säuglings. By Dr. ERICH SAUPE and Dr. KURT EHLE. Lehmanns' Medizinische Atlanten, Band 17. Munich: J. F. Lehmanns. 1929. Pp. 41. M.6.

THIS volume of Lehmanns' well-known Atlas is a development of Dr. Saupe's "Thoraxröntgenbild im frühesten Kindesalter" (vol. 10 of this series, which appeared in 1925) and deals with the radiological appearances of the normal infant chest. It is based on 100 cases, after careful exclusion of pathological ones by painstaking clinical and laboratory investigation. The technical difficulties in this branch of radiography have been ably tackled by the authors, who have shown, in 16 good autotype reproductions from their radiograms, the fallacy of the generally accepted statement that the details of an infant's lung cannot be satisfactorily demonstrated by X rays. Their technique makes use of soft radiation and short exposures (effective kilovolts 35, milliampères 70; focal distance 70 cm.; exposure one-tenth sec. with screens), the recumbent child being maintained in a correct position with the head median. The considerable variations in the cardiac and mediastinal shadows and their causes, including slight enlargements of the thymus, are fully discussed with the aid of line diagrams. The lung detail at this age tends to be coarse and patchy, and, since it is almost entirely vascular in origin, shows considerable variation even in the same child at different examinations, according to the degree of filling of the vessels, which in turn depends on the phase and depth of respiration. In crying children this coarse patchy appearance is increased. The impossibility of inferring the presence of a bronchitis is emphasised. The translucency of the lung fields also shows marked variation, and we learn that an inclination of the head to one side suffices in infants to diminish the translucency of one apex through slight compression of the thin-walled bronchus. The monograph, though small, is of considerable practical value and, since it deals with a difficult and somewhat neglected subject with a refreshing absence of dogmatism, it will be welcomed by the radiologist. The references to literature are exclusively to continental publications and neglect the excellent work done in America, notably by W. W. Wasson and other workers in this field.

PHOTOGRAPHIC TECHNIQUE IN RADIOLOGY.

Die photographischen Grundlagen des Roentgenbildes. By Dr. RICHARD HERZ. Leipzig: Georg Thieme. 1929. Pp. 225. M.19.

THE author has confined himself to a straightforward description of the photographic side of the technique of radiography, but he has done his work exceedingly thoroughly and satisfactorily, with the result that the book is not only of use to beginners but also to advanced workers. Particularly interesting and useful is the chapter on the causes of faults and artifacts in films. It is a work which should be in the possession of every radiologist and, though technique may change, it will be many years before it is likely to be out of date.

SEWAGE DISPOSAL.

Principles and Practice of the Dilution Method of Sewage Disposal. By W. E. ADENEY, F.R.C.Sc.I., D.Sc., F.R.San.Inst., Curator and Examiner in Chemistry in the late Royal University of Ireland; Fellow and a former Vice-President of the Institute of Chemistry. London: Cambridge University Press. Pp. 161. 12*s.* 6*d.*

Sewage Disposal from Isolated Buildings. By G. M. FLOOD, B.Sc.Eng., A.M.Inst.M. & C.E., A.M.I.Struct.E., M.R.San.I., F.I.S.E. Manchester: Sutherland Publishing Co., Ltd. 1929. Pp. 257. 12*s.*

THE self-purification of polluted rivers and streams is becoming of increasing importance, especially in view of the establishment of new industries, such as the extraction of sugar from sugar beet and the manufacture of artificial silks. Such industries are being established on the banks of rivers which were formerly pure streams, with disastrous results to the fish and aquatic life. Dr. Adeney's work on questions relating to the oxygenation of water in rivers and estuaries has been of great value, and this volume not only gives a clear account of that work but includes a summary of the literature. The fermentative changes which occur when sewage is discharged to fresh water streams are described in a lucid manner. The researches in progress on the mechanism of the biochemical changes which occur during the fermentation of sewage matters in water are outlined, and the part played by saprophytic and nitrifying organisms in the purification of sewage and similar pollution made clear. Valuable sections are devoted to the rates of consumption of dissolved oxygen by sewage matters in fresh and sea waters. We have here a useful addition to the literature of the subject.

The question of sewage disposal is one of great importance from the sanitary point of view and often involves difficult problems with regard to the protection of water-supplies and the avoidance of nuisance. Mr. Flood has attempted to cover rather too much ground, and has introduced material of a highly technical character which is not germane to his object of giving "definite constructive information." The descriptions and constructional details of various types of plant are good and will prove useful to sanitary authorities. The illustrations are numerous and well selected and indicate clearly the arrangements necessary in the various conditions that may arise. The sections of the book which include elaborate accounts of various organisms found in sewage and alleged to take part in sewage purification might have been omitted without loss of value. Such information can be obtained readily and more accurately in special works on the subject. The descriptions and nomenclature of organisms are not always strictly accurate. Chapter XI., devoted to the design of filters, contains much useful information, but the capacities recommended are much underestimated and engineers constructing plants would be well advised to make more liberal provision.

Collection of Published Papers.

Published Papers by Members of the Staff of the Middlesex Hospital Medical School: 1928–29.

THIS collection of over forty papers published during the last academic year contains valuable contributions to medical science, many of which have previously appeared in these pages. From the Bland-Sutton Institute of Pathology come contributions on the subject of malignant disease, such as Prof. J. McIntosh's paper on the Rous Tumour and Its Bearing on the Virus Theory of Cancer, and that on Giant-cell Tumours of Bone in a Fowl, by Dr. S. L. Baker. The biochemical department contributes many valuable papers, such as that on the Œstrus-producing Hormone, by Prof. E. C. Dodds and three of his colleagues, while the department has also collaborated in a big piece of team-work research with Mr. G. Gordon-Taylor, Mr. R. V. Hudson, and Dr. L. E. H. Whitby on the Remote Results of Gastrectomy. From the Cancer Research Laboratories and Department of Physics there are several papers on the effects of radiation, of which that by Prof. S. Russ and Miss G. M. Scott on the Differential Action of X Rays and Gamma Rays upon Some Living Tissues is an example. The Physiological Department is represented by some interesting studies, notably that by Prof. Swale Vincent and Mr. J. H. Thompson on the Rôle of the Thyroid and Parathyroid Glands in Vaso-motor Reflexes. Lastly, there are many important contributions on clinical medicine and surgery, of which Dr. Shirley Smith's paper on the Pain and Discomfort of Congestive Heart Disease, and Mr. Sampson Handley's several papers on breast carcinoma may be mentioned. These few examples serve to show that the staff of the Middlesex Hospital continue to regard research as one of their most important duties. We must repeat the plea made in previous years—that such a collection deserves a more permanent and fitting production than the conglomeration of reprints of various shapes and sizes assembled in this volume.

JOURNALS.

JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXXIII. Pp. 1–232. January, 1930.—The production of staphylococcal toxin, by F. M. Burnet (Melbourne). *S. aureus* does not produce hæmolysin in broth cultures unless the cultures are incubated in an atmosphere containing excess of CO_2. The white variants produce hæmolysin freely.—The pathogenesis of and propagation of the virus in experimental poliomyelitis, by R. W. Fairbrother and E. W. Hurst (London). The disease begins as a primary degeneration of nerve-cells with an inflammatory reaction of the connective tissue, not as a meningitis. After intracerebral inoculation the virus spreads along the axis-cylinders downwards, and owing to the greater susceptibility of the lumbar nerve-cells symptoms usually appear first in the legs; the symptoms are therefore no guide to the spread of the virus or to the point of entry. Virus is present in greatest amount in the neighbourhood of the lesions in the cord; it survives for only a few days in the cerebral cortex and hardly ever reaches the cerebro-spinal fluid.—The action of certain dyes on the bactericidal activity of normal serum and on hæmolytic complement, by J. Gordon (Leeds). Congo red and other dyes prevent the hæmolytic and bactericidal actions of serum; the mechanism is not yet explained.—Dysentery toxin (Shiga), by C. C. Okell and A. V. Blake (London). Active preparations of Shiga toxin may be obtained by filtering broth cultures after about a fortnight's growth, and from this filtrate the toxin may be precipitated by ammonium sulphate. In the early stages of growth the toxin is held within the bodies of the healthy bacilli; afterwards autolysis gradually disintegrates the bacilli and sets free the toxin into the medium.—Generalised osteitis fibrosa with parathyroid hyperplasia, by A. M. Drennan (Dunedin). A typical example in a woman of 63 with a large parathyroid adenoma.—Miliary aneurysms in the brain, by F. H. K. Green (London). Small aneurysms are found only in a small proportion of deaths from cerebral hæmorrhage, and only where the media of an artery is grossly involved in atheromatous degeneration. The anatomy of two examples is minutely described.—The pathology of disseminated encephalomyelitis of the dog (the "nervous form of canine distemper"), by J. R. Perdrau and L. P. Pugh (London). The disease has nothing to do with distemper; its relation to the "hysteria" of dogs is doubtful. There is a characteristic infiltration of the meninges and perivascular spaces of the brain with small round cells, and in four instances demyelination of the type seen in acute disseminated sclerosis was found.—Oat-celled tumours of mediastinal glands, by J. B. Duguid and A. M. Kennedy (Cardiff). Barnard showed that most oat-celled tumours of the chest are carcinomata of bronchi; this is not invariably the case, for a few arise from the mediastinal glands.—The changes in the mammary gland preceding carcinoma, by A. A. Charteris (Glasgow). Most cases arise from epithelial proliferation in the ducts.—Further experiments on the carcinogenicity of synthetic tars and their fractions, by C. C. Twort and J. D. Fulton (Manchester). The activity of a number of artificial tars varies with the substance used as a source and with the temperature of distillation; it may be greatly reduced by oxidation or reduction, and may be concentrated by fractional distillation.—Note on the fermentation of starch by certain hæmolytic streptococci, by F. W. Andrewes (London). Some strains ferment, others do not; the power is not related to pathogenicity.—Spontaneous tuberculosis in the guinea-pig, by A. Stanley Griffith (Cambridge). Seven examples of this rare condition, which may be caused by human bovine or avian bacilli.—The specificity of active immunity against snake venoms, by C. H. Kellaway (Melbourne). The specificity of the active immunity induced in guinea-pigs by fresh or formalised venom depends on the zoological relation of the snakes involved and the constitution of the venom, the former being more important. The specificity is not so clearly marked as with the corresponding antitoxic sera and immunisation with, for instance, copperhead venom confers a considerable resistance to tiger snake venom.—The late results of intravenous injection of colloidal iron, by D. F. Cappell (Glasgow). The iron is first taken up by the reticulo-endothelial system generally and afterwards redistributed, accumulating in the liver, spleen, and lymphatic glands. Nothing like hæmochromatosis is produced.—Cholelithiasis in the insane, by G. W. T. H. Fleming (Dorchester). At the younger ages (20 to 40) gall-stones are more frequent in the insane than in an average hospital population.—The thermal death-rate of the bacteriophage, by S. H. Nanavutty (London). The fatality of heat to bacteriophage varies with the suspending medium. The mode of death suggests that the individual units vary in their heat resistance.—Titles of the other papers are: An unusually large adenoma of the liver, by R. G. Dhayagude (Bombay).—On testing *C. diphtheriæ* for virulence by the intracutaneous method, by W. Mair.—A colour-index ratiometer, by F. T. Grey.—The prognostic value of protein determinations of the cerebro-spinal fluid, by F. T. Grey.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 1, 1930.

THE BACTERIOLOGY OF INFLUENZA.

THE publicity given to recent work at Chicago on the bacteriology of influenza has again turned attention to this problem. It has been maintained by some epidemiologists that the disease clinically known as influenza is but part of a much more comprehensive wave of morbidity which constitutes the true influenza. It seems a pity that the same name should be used for such distinct ideas. Whether this conception is correct or not it is obviously of advantage to discover the exact microbic infection in the cases of disease, and a great deal of work has, of course, been directed towards this end. The similarity of the curves of rise, fall, and recurrence of influenza in 1889–90 and 1918–19 epidemics, and (as far as records go) in previous epidemics, suggests that some uniform factor was at work. The forms of the waves and the type of disease were apparently independent of climate, season, and country, though the rate of mortality was probably influenced by the weather to some extent. There is evidence that scattered cases of influenza-like disease of moderate severity have preceded the two great pandemics of the last 40 years. The first wave of the epidemic is characterised by cases of severe acute fever, often with only slight signs of localisation in the upper air passages. After the rapid rise and fall of this wave and an interval of one or two months, the second wave appears with a much more definitely bronchitic and pneumonic form of disease. Later, a further wave or waves occur with catarrhal or pulmonary cases, of irregular but usually lessened severity. How far epidemics confined to a single town, country, or continent should be considered to belong to the same type as pandemic influenza is undecided.

It is generally acknowledged that influenza is a disease spread by infection, but the symptoms of patients, especially at different periods of the epidemic, are very diverse. The clinical diagnosis of individual cases is notoriously unreliable and comparative certainty is only reached in the presence of an epidemic. The change in character of the symptoms and lesions from one period or wave to another needs some special hypothesis to explain it, in whatever category of causes it is sought. Whether the primary causes of the epidemic are conceived as external to the human body and its invading microbes, or as concerned with the infecting micro-organisms themselves, this changeability undoubtedly is an essential feature. Inquiry has been chiefly directed to finding out whether changes in the bacterial agents alone may not be a sufficient reason for the variation in the disease and the course of the epidemic. Three main kinds of micro-organisms are known to infect and invade the tissues in many cases of influenza and have been inculpated in turn by bacteriologists. These are the *Bacillus influenzæ* of Pfeiffer, various streptococci, including the pneumococcus, and *B. pneumosintes*. The last, though probably related in some way to certain outbreaks of so-called influenza, has only occasionally been recognised, and its claim to importance rests on its association with a limited number of cases of the disease. The pneumococcus undoubtedly may be a serious infectant but has never been held to be the sole primary infective agent. Various strains of the streptococcus are very frequently found in infections of the air passages in influenza, but particular influenzal types have not been widely recognised, though in some outbreaks—especially in the more severe phases—streptococci have been held responsible for broncho-pneumonic lesions. The claim by FALK and his colleagues[1] to have identified the streptococcus which caused the epidemic in Chicago in 1928–29 does not, so far, carry conviction but cannot be fully discussed till a more complete account of their work is accessible.

All the above-mentioned bacteria have often been found acting in company as pathogenic agents. Their relative prevalence and claims to importance are well and critically reviewed by Dr. W. M. SCOTT in Vol. II. of the "System of Bacteriology," which is being issued by the Medical Research Council. *B. influenzæ* is the only bacterium which has sufficiently often been found in intimate association with the disease processes to justify the claim that it is the essential pathogenic organism of influenza. Its rôle is much disputed, however, and the first point to decide in discussing the ætiology of influenza is whether a virus infection predisposing to a bacterial secondary invasion must be invoked to account for the rapid spread and high infectivity of the disease and its other features. There is little doubt that *B. influenzæ* and streptococci gain in pathogenicity during an epidemic and it is perhaps gratuitous to import an unproven virus to account for the increase of susceptibility to these infections. It would be necessary to assume that as the hypothetical virus spread over the world the secondary agents accompanied it, unless it were thought that these latter were ubiquitous and in each case assumed increased virulence under the influence of the virus. Such an explanation would not be complete, since the virulent secondary infections are almost certainly sometimes passed from patient to patient. It seems simpler to suppose that occasionally a bacterial agent assumes increasing virulence and by passage through many susceptible subjects further adds to its invasive and pathogenic powers and becomes associated with fresh colleagues in its course. The rapid transference is aided by the increased bronchial secretions and their expulsion and dissemination by coughing. Such an increase in pathogenicity of the infective agent is a necessary hypothesis in any attempted explanation of influenza and is known to occur to some extent in experiments with *B. influenzæ* and streptococci. It is no greater assumption to suppose increased virulence of these bacteria than of an unknown virus which would also be required to bring about increase of virulence in several kinds of bacteria. In estimating the relative probability of such occurrences one must take into consideration that the *B. influenzæ* is known to be remarkably variable in its cultural characters and toxicity. Though described by PFEIFFER in 1892, the methods required for its identification and its cultural needs have only been completely understood in the last eight or nine years as the result chiefly of the work of FILDES[2] and TJÖTTA and AVERY (1921),[3] on the X and V accessory growth factors and the new method of selective culture by the use of aspergillin demonstrated by FLEMING[4] last year. The culture and isolation of *B. influenzæ* was not so readily obtained in 1918 as at the present day and this may explain its apparent absence in some outbreaks.

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[1] See THE LANCET, Jan. 25th, p. 197.

[2] Fildes, P.: Brit. Jour. Exper. Path., 1921, ii., 16; 1923, iv., 265.

[3] Tjötta, T., and Avery, O. T.: Jour. Exper. Med., 1921, xxxi 97 and 455.

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PROFESSIONAL PRIVILEGE: THE QUESTION OF DIVIDED LOYALTIES.

A South African journalist has gone to prison sooner than disclose information which came to him under a promise of secrecy. He had to choose between two loyalties—a dilemma, not entirely academic, which the medical profession has sometimes to encounter. The journalist had written an article on the subject of an alleged illegal lottery; he was thereupon questioned by a magistrate under the Police Administration Act, presumably with a view to criminal proceedings in which his evidence might have been material. He refused to answer the magistrate's questions. No doubt it was pointed out to him that journalists enjoy no form of professional privilege under the law, and that every citizen owes the State the duty of assistance in the detection of crime. He preferred, however, to remain faithful to his promise, and he left it to the police to carry out unaided their function of discovering a criminal offence. It happens that not long ago a similar incident occurred in America. A Washington newspaper had been dealing with alleged breaches of the prohibition laws. Three of its reporters were summoned before a grand jury and were asked as to their source of information. They, too, declined and were sentenced to imprisonment. Perhaps it is unnecessary to point out that the jurisdiction in both the South African and the Washington incidents is not one which operates in England. Apart from a remarkable clause in the Official Secrets Act of 1920 (an unobtrusive survival of the wide powers entrusted to the executive during the war), there is no power in England for the police or grand jury to interrogate witnesses at large under threat of imprisonment for refusal to answer. It may, however, happen at any time that a medical practitioner may be pressed in the witness-box to disclose his patient's confidences entrusted to him under a pledge of secrecy not less binding because not formally expressed or legally sanctioned.

The Washington journalists, it seems, have served their imprisonment; they have maintained the principle for which they stood and their case is ended. It is not clear whether the South African journalist is imprisoned indefinitely or not. It seems a case in which the prospect of appeal is dubious, but it is said that an appeal is being undertaken Publicity will bring public opinion to bear on one side or the other, and in the long run the law must conform to public opinion. If, in an extreme case in England, a doctor refused to answer questions in the witness-box on the ground of professional privilege, would public opinion support him? The court, jealous of its authority, would not lightly pass over what it would regard as an act of disrespect. Wilful disobedience to a subpœna not only means attachment for contempt of court, it also involves possible liability to the party at whose instance the witness summoned for any damages which that party can w that he has suffered by the loss of the evidence. latter liability, naturally, would not arise if the uant called the doctor as a witness, because ivilege is in the interest of the patient, and the can absolve the doctor from the duty of secrecy. The general question of medical privilege has never been pressed upon popular notice; for this purpose some such sacrifice may be required as has lately been made in the two cases under discussion. The legal profession is allowed by law a complete privilege; the explanation is that people cannot get justice unless they can be sure of frank consultation with their legal advisers. The medical profession is allowed by law no privilege at all, though frank consultation between patient and medical adviser is obviously an essential condition for the treatment of ill-health. The public ought to consider whether the tradition of medical secrecy deserves support. It should do so without the excitement of seeing medical martyrs volunteering for prison for the sake of principle.

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THE CASE AGAINST THE WIDAL TEST.

IT appears from various reports that a modification of the agglutination test of Widal is likely to have a wider and more useful application in the diagnosis of typhoid fever than did the original test, and that the Widal though practised with a perfected technique is still open to much criticism. It fails in three respects—namely, in the early serological diagnosis of typhoid fever; in the previously inoculated individual; and in the persistently negative cas and it has never held out any hope of detecting t carrier. That a negative Widal reaction is frequen a most misleading report, is an opinion widely h among clinicians. That it may become positive the third or fourth week of disease is of comparativ little value to them. Laboratory workers, howe must have criticism based on unquestionable diagn before deciding to abandon the test. A series of c reported by FELIX[1] in which cultures were made, a larger series by PIJPER[2] in which cultures complement fixation were done, amply confirm general impression. In PIJPER's series, assumi dilution of 1 : 40 as diagnostic, then out of 199 sam of serum (representing 120 cases) only 160, or 80 cent., were positive, while if 1 : 80 be taken as crucial dilution, only 102, or 51 per cent., were posit Or analysing his figures from the more pract clinical point of view, only 72 cases, or 60 per cent., positive in a dilution of 1 : 40 at the time of the serological examination, which is the time when clinician really needs help. There is clearly here for improvement greater than that afforde the perfection of quantitative standardisation as is achieved by Dreyer's technique. Next in pra importance at the present time is failure of the test to afford help in the inoculated person. has stated,[3] and is supported in this belie numerous authorities that "it is now estab beyond all question that after the agglutinins are produced by vaccination have already disap from the blood, they can reappear after many under the non-specific stimulation of some typhoid disease as an anamnestic reaction." the interpretation of a positive Widal in a previ inoculated person is always open to doubt. The t failure is in the persistently negative case, whose se at no time during disease or convalescence give positive agglutination test. Attention has be drawn to these cases by FELIX, PIJPER, and BURNET, and in our last issue by GARDNER, HOBSON, and STENHOUSE.[4]

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[3] ives ing, A.: Brit. Jour. Exper. Path., 1929, x., 226.

[4] Fle y e.

[1] Felix, A.: Journal of Immunology, 1924, ix., 115.

[2] Pijper, A.: S. A. Medical Record, 1923, xxi., 51 and 74.

[3] Felix, A.; Loc. cit., p. 137.

[4] Gardner, A. D., Hobson, F. G., and Stenhouse, G.: THE LANCET, Jan. 25th, 1930, p. 182.

Independent attempts to solve these difficulties were made by FELIX and by PIJPER; the former succeeded by means of his "qualitative receptor analysis," the latter by an application of complement fixation. Both these substitutes achieve the same ends. They enable an earlier diagnosis to be made; they bring to light the nature of the disease in the persistently negative case, and they circumvent the difficulty presented by previously inoculated individuals. Further, PIJPER has shown that carriers react positively to complement fixation, and by Felix's method the whole enteric group can be differentiated in one dilution without titration of the serums. The principles of complement fixation are sufficiently well known to need no introduction. Qualitative receptor analysis, dependent on the detection of "O" (or group small-flaking agglutinins) and "H" (or specific large-flaking agglutinins) is still somewhat of a mystery. In its simplest terms it means that instead of the typhoid bacillus possessing one kind of agglutinogen only, giving rise to one kind of agglutinin, it may be, and usually is, composed of two antigens the "O" or group and the "H" or specific. These are named in German *Hauch* and *Ohne Hauch* from the spreading and non-spreading growth of *B. proteus*, in which organism these antigens were originally discovered by WEIL and FELIX. "O" antigen gives rise to "O" agglutinins only; "H" antigen gives rise to both "O" and "H." Now in the majority of cases of typhoid, the "O" agglutinin appears in the serum at an earlier date in the disease than the "H" form, and it is the latter type of agglutination which an ordinary Widal test detects. It does so because nearly all test suspensions consist of "H" forms of typhoid bacilli. Thus the useful early appearing "O" agglutinin is entirely missed. In inoculated persons the anamnestic reaction is accompanied by "H" not by "O" agglutinins, therefore the appearance in a subsequent fever of "O" agglutination indicates that the disease really is an enteric fever. It must be pointed out, however, that "O" agglutination is a group reaction—i.e., it is common to typhoid, the paratyphoids, and Gaertner infections, and further differentiation within the group may have to wait till "H" agglutinins appear; but that the disease is due to a bacillus of the group will be certain, for the small flakes are not provoked by other fevers. It will be seen that in the inoculated person differentiation within the group may be impossible. The further discovery by FELIX of the culture known as *B. typhosus* 901, which is extremely sensitive to "O" agglutinins, and remains so in subculture, has enabled practical use to be made of this analysis. This work has been repeated and confirmed by BURNET, PIJPER and STUART and KRIKORIAN. The exact relation which these antigens bear to rough and smooth (somatic and flagellar) and to the chemically isolated antigens has not yet been established.

An example to which we have already referred of the persistent negative Widal reaction in the case of typhoid fever reported by GARDNER, HOBSON, and STENHOUSE, illustrates the usefulness of the new method. A patient with a clinical picture of severe typhoid fever had Widal tests done on the nineteenth and twenty-fifth days of the disease. On both occasions they were negative but on the second occasion the serum was tested for "O" agglutination, and a blood culture was made. The "O" agglutination proved positive (1 : 500 with living saline suspensions of *B. typhosus* 901) and a non-motile typhoid bacillus was isolated from the blood. Had the "O" agglutination test not been done in this case, the diagnosis would still have remained in doubt till the bacillus became motile. The authors, as a result of their experience, recommend "O" suspensions to all pathologists and clinicians. *B. typhosus* 901 is in the National Collection of Type Cultures; and Dr. GARDNER has prepared standard suspensions from it at Oxford.

Annotations.

"Ne quid nimis."

HEALTH OF THE ARMY IN 1928.

THE annual report on the health of the Army, which has just been issued,[1] is signed by Lieut.-General H. B. Fawcus; it appears a month earlier than last year, is of the same size but costs sixpence more. It tells of improving conditions; influenza was almost absent, malaria was decreasing, in India the malarial sickness-rate fell from 138·8 to 91·3 per 1000, and the sick daily from 3·40 to 2·40. In the Army at home and abroad there were 183,333 men, of whom per thousand 426·2 (last year 467·7) were admitted to hospital, 1058·9 (1106·7) were treated as out-patients, and 38·98 (42·79) were daily under treatment. There were 9464 officers, of whom 29 (10) died from injury. There were fewer cases of disease this year among cadets, and diphtheria was the only serious preoccupation in the schools for boys; Schick testing and immunisation approved themselves after experience, and all new entrants to the schools are to be thus dealt with in future. Among the men, the chief causes of admission to hospital were venereal disease, 30·3 (49·1), malaria, 35·7 (49·5), and tonsillitis, 33·3 (33·8). The death-rate was 2·36 (2·42), the chief causes being: injuries 133, pneumonia 59 (73), "other digestive diseases" 44 (43), tubercle 30 (32), "other infective diseases" 25 (20), suicide 25 (38), tumours 24 (9), enteric group 20 (15). The invaliding rate was 9·06 (11·43), chiefly due to disease of the middle ear and to tubercle, 207 (213) cases, 1·13 (1·08); 34 were invalided for hysteria. The disease causing most loss of service is gonorrhœa; the average case seems to last 58·5 (53·1) days. Scabies cases were cured in a day less than last year, 7·16 days. Dysentery is in India mostly bacillary, 80 per cent.; immunisation by bilivaccine was thoroughly tried, but results were conflicting. Enteric cases were 30 at home, 20 of them in one epidemic at Aldershot, cause not stated. About 98 per cent. of the Army—officers, men, women, and children—is protected by inoculation. Single doses of the protective vaccine are thought ineffective; it seems to be the idea that cases are mostly spread by carriers. Malaria, 6550 (9204) cases, 35·7 (49·5) has greatly decreased, the figures for India are 5142 (7723), 91·3 (138·8). For their protection troops are sent to the hills during the malarial season, barracks and houses are mosquito-proofed with copper wire netting, and mosquito-breeding places are controlled. At a new station, Changi, near Singapore, the anopheles group are so reduced that it is thought mosquito-proofing of the new barracks will be unnecessary. Paris green powder, harmless to larger animals, is cheaper than oil for destroying larvæ. As to treatment, plasmochin has been found to prevent relapse better than any other drug used. Treatment of pneumonia with rectal injections of permanganate was strongly approved in Cairo, but not at Woolwich. Tubercle is less, but there is no table of the prevalence at ages, as in the last R.A.F. Report.[2] Sandfly fever was more frequent. As appendicitis cases come to notice quickly, results are good; 1144 cases with but

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[1] London: H.M. Stationery Office. 1930. Pp. 144. 5s.

[2] See THE LANCET, 1929, ii., 990.

15 deaths. Of Mediterranean fever one case was definitely diagnosed, but over 900 occurred in Malta in 1928. Of knee cartilages, 202 internal were removed and 6 external; all the patients went to duty. Twenty-four gastric ulcers were operated on but six died; 28 duodenal with one death. Extensive improvements are being made in barracks, married quarters and hospitals, also in feeding the men and cooking for them. The Thames flood of January, 1928, wrecked two museums of the R.A.M.C. College, but they are being restored. Pathological laboratories are being put into all Indian hospitals. Four laboratory-diagnosed enteric cases are noted, one thought to be sandfly fever, one broncho-pneumonia, one nephritis, one jaundice. Of the malaria cases, 72 per cent. were benign, 14 malignant tertian, 1/10 per cent. quartan, only 13 per cent. were not microscopically diagnosed. At Hong-Kong, in 50 obstinate jaundice cases, half were found to have ascaris, which being removed they recovered. A single case of scurvy was diagnosed in London, but no signs or symptoms are mentioned. A new first-aid packet is being prepared. There is much of interest in this report.

BERI-BERI IN A WHALING EXPEDITION.

It might have been expected that, with our present knowledge of the ætiology of beri-beri, a well-organised whaling expedition would be able to avert this calamity. That this is not so is evident from a paper in *Tidsskrift for den Norske Laegeforening* for Dec. 15th, 1929, in which Dr. Johannes Nissen, medical officer to a Norwegian whaling expedition, discusses a state of affairs which gave him good reasons for the greatest anxiety. It may be added, by way of preface to his paper, that the revival of the Norwegian whaling industry during the last two decades is almost the only bright spot in the financial situation of a country suffering profoundly from post-war commercial depression. Thousands of Norwegians depend on the whale for their living, and any factor interfering with the smooth running of whaling expeditions may be a serious matter to the whole country. Dr. Nissen was attached to a South Shetland whaling expedition in 1927–28. In the middle of March, 1928, beri-beri broke out on a boat, *Pythia*, which was stationed a day's journey from Deception Island, where Dr. Nissen was working. Early in April three of the crew had to be landed and admitted to hospital on the island, one of them dying two days after admission. There were altogether 37 well-defined cases of which five were severe. There were also 14 other cases of early beri-beri in which objective signs of the disease were not demonstrable; the men complained of lassitude, tenderness of the muscles of the legs, palpitation of the heart, and a feeling of ants creeping on the skin. In the well-defined cases the abovenamed symptoms were followed by the development of œdema about the ankles and front of the tibia, by anæsthesia and absence of the patellar reflex, and in five cases by pareses. The dietary of the expedition was rich (too rich in Dr. Nissen's opinion) with three hot meals a day; peas, salt meat and pork twice a week, pork and beans twice a week, a soup of salt cabbage and carrots once or twice a week, stewed dried apricots or prunes, salted and dried fish once a week, "betta" soup or salt mackerel or herring once a week, tinned meat twice a week, and from the new year onwards fresh pork once a fortnight. Whale meat was occasionally eaten, and potatoes every day. But while five of the seven boats of the expedition were provided with wholemeal bread, in addition to ordinary fine rye bread and wheaten bread, or a mixed loaf containing rye and wheat flour, the bread eaten on the *Pythia* was made from finely sifted rye flour of poor quality. Dr. Nissen is inclined to trace the outbreak of beri-beri chiefly to this but also to several other causes. In addition to the lack of wholemeal bread, he noted that the sleeping quarters of the crew were damp and dirty as compared with those of the other ships. He also found that the potatoes were in an unsatisfactory state, and it would seem that on a ship's voyage from Norway, through the tropics, to the Southern Hemisphere, some of the crew are employed almost all the time in attending to sprouting potatoes which, after they have been stripped two or three times of their sprouts, have presumably lost most of their B-vitamins. This difficulty cannot be got over by provisioning a ship with potatoes in a South American or South African port, for the Norwegian sailor dislikes the insipid and sweet taste of potatoes grown south of the Equator. Dr. Nissen, therefore, suggests that the quarters on board ship reserved for food storage in the ships of whaling expeditions should be subject to much more stringent regulations than at present, and that, as far as potatoes are concerned, a cool place must be provided, the temperature of which can be kept only a couple of degrees above freezing-point. Yet another recommendation is that the rich dietary of the present régime should be simplified, For, as various observers have remarked, it is the fat man rather than the lean man who develops beri-beri. Dr. Nissen adds that medical officers of modern whaling expeditions often find dyspepsia the most frequent of all the ailments on board ship. He concludes: "The dietary of our fleet should be completely changed."

CORONARY THROMBOSIS.

Dr. S. A. Levine's review[1] of the Clinical Features of Coronary Thrombosis is based on a series of 145 cases, reports of which are given in full. Forty-six of these cases eventually came to autopsy and the pathological findings are considered in detail. Most of his patients had suffered from ordinary angina before the onset of coronary thrombosis, but some had apparently enjoyed unusually good health up to the moment of the attack, and had indulged actively in sport or other forms of vigorous physical work. In 34 cases glycosuria was present, and of these a considerable number were actually diabetic. Fifty-eight patients were known to have suffered from high blood pressure and in several others sclerotic changes were found in the retinal arteries. In some instances there appeared to be a definite familial tendency to hypertension or coronary disease. Neither syphilis nor rheumatic infection seemed to be directly related to the condition. The disease was much more common in males than in females, and the average age of the group was 57·8 years.

The pain of coronary thrombosis differs from that of ordinary angina in its duration and in not being relieved by nitrites, since the attack itself is usually associated with a sudden fall in blood pressure. After the attack the heart sounds are weak, and auricular fibrillation, ventricular tachycardia, gallop rhythm, and other disturbances of the cardiac mechanism are apt to be present. A pericardial friction rub may be heard. In addition to these purely cardiac manifestations, shock, vomiting, and dyspnœa serve to distinguish coronary thrombosis from ordinary angina, while the infarction often gives rise to a slight rise of temperature and a leucocytosis in the blood. In fatal cases death may be due to ventricular fibrillation, shock, or rupture of the heart, while patients who survive the early complications are liable to manifest a progressive type of congestive heart failure. Fifty-three per cent. of the patients in Dr. Levine's series died as the immediate result of the attack. He deals very fully with the electrocardiographic signs of coronary thrombosis, and illustrates his paper by numerous records, but he points out that the characteristic changes are not present in all cases. As regards treatment, he advocates avoidance of cardiac stimulants when the systolic pressure does not fall below 100, and prefers to concentrate attention entirely on the relief of pain by adequate doses of morphia. When, however, the patient is in a state of collapse, caffeine.

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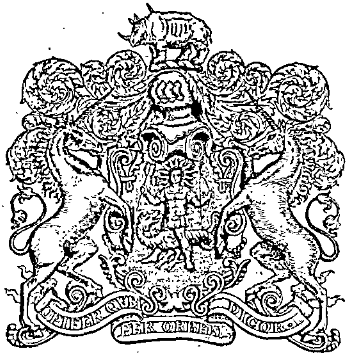
[1] *Medicine*, Sept., 1929. Obtainable in England from Messrs. Baillière, Tindall and Cox, London.

adrenalin, or strophanthin may be helpful, and in dealing with the important complication of ventricular tachycardia quinidine is called for. In 39 of the 46 cases (85 per cent.) in which an autopsy was obtained, the vessel involved was the anterior descending branch of the left coronary artery. Less commonly there was a diffuse arterio-sclerosis involving the smaller coronary branches and leading to chronic fibrous myocarditis. Dr. Levine suggests that this group probably provides most of the clinically atypical cases in which infarction is unaccompanied by pain. In two cases only was occlusion in the right coronary artery revealed post mortem, and it is interesting to note that in neither of these did the patient complain of pain.

OPIFERQUE PER ORBEM DICOR.

THE motto accompanying a coat-of-arms has sometimes very little obvious connexion with the blazon or with the status and occupation of the person or persons to whom it was granted. It is rare, indeed, to find a motto so appropriate as that of the Society of Apothecaries of London. It completes the achievement, not only in furnishing a clue to the meaning of the escutcheon, but also in showing in a very definite sense the aims and objects of the ancient guild to which it was granted. In a paper recently read before the Historical Section of the Royal Society of Medicine[1] Dr. T. Vincent Dickinson, a past Master of the Society of Apothecaries, gave some interesting information and details of the Armorial Bearings. These were devised, he said, by William Camden, Queen Elizabeth's celebrated Charenceaux King of Arms, in 1617 soon after James I. had finally separated the Apothecaries from the Grocers and Pepperers at the instance of Gideon de Lame and granted them a Charter of their own. The details and motto are founded on the episode of Daphne in Ovid's Metamorphoses. Apollo, who has just killed the gigantic python, "Qui modo pestifero tot jugera ventre prementem stravimus innumeris tumidum Pythona sagittis" is depicted with radiant head denoting his sun godhead with a golden bow in his left hand and an arrow in his right, striding over the prostrate foe. It seems to indicate an energetic and combative spirit and points the moral that the occupation of the Apothecaries was not merely mechanical like that of the Barber-Surgeons, nor purely studious and abstract like that of the Physicians, but was an Art founded on action with a firm grasp of the weapons wherewith to combat disease and an ever ready recourse to the means of doing so. Ovid states that the first of Apollo's loves was Daphne, daughter of Peneus, "a love that no blind chance brought to him but Cupid's heartless wrath." Apollo, having just killed the Python, twitted Cupid: "Wanton boy, what hast thou to do with warrior's arms?" And Cupid's answer was: "Thy bow may pierce all else, but mine shall pierce thyself." Thereupon from the quiver which held his arrows he drew forth two shafts of diverse powers; the one banishes love, the other creates it. That which creates love is made of gold and has a bright keen point, but that which banishes love is blunt and has a barb of lead at the tip. Now this latter did the God Cupid fix in the heart of the nymph Daphne, the daughter of Peneus, the River God, but with that other he wounded Apollo to the very marrow, piercing all his bones. Straightway Apollo was love-sick but Daphne fled from the very name of lover and took solace in the gloom of the forest. When Apollo pleaded his suit, faster than the light wind she fled away and paused not at his words as he tried to call her back. "O Nymph! O daughter of Peneus, I pray thee stay! Rash one, dost thou not know from whom thou art flying? Jupiter is my Sire; medicine, too, is my discovery, and I am called all the world over the Bringer of Aid. (*Inventum medicina meum est, opiferque per orbem dicor.*) For the virtue of all herbs are at my bidding, but woe is me: for love may not be cured by any herbs." But Daphne prayed to her father to change her fatal beauty and she became transformed into a laurel. Even in this shape Apollo loved her still. "Now since thou canst not be my wife, thou shalt be my tree. My locks, my lyre, my quiver shall wear thee ever, O laurel tree! and even as my brow is ever young with locks unshorn, so do thou likewise keep evergreen for all time the beauty of thy foliage." The motto is an exortation to all descendants of Apollo, the discoverer of Medicine, bringers of help, that they too may keep evergreen for all time and that each member of the craft may follow his footsteps and example and ever seek more and fuller knowledge of that healing Art which can assuage all ills but that of love, and gird their loins and discharge their shafts against the dragon of disease so that when the victory is ours each may say with truth "Opiferque per orbem dicor."



ACTINOMYCOSIS IN MAN AND ANIMALS.

THE investigation of actinomycosis has not kept pace with that of other granulomata, such as tuberculosis and syphilis, during the last 50 years. Dr. Leonard Colebrook, addressing the Combined Section of Comparative Medicine and Surgery at the Royal Society of Medicine on Jan. 22nd, suggested a revision of the confused nomenclature at present in use. His classification is as follows:—

I. Infections associated with granules bearing clubs. Due to: (1) *Actinomyces bovis* (Wolff Israel). (2) Mycelial organisms distinct from *Actinomyces bovis*. (3) Actinobacillus of Lignière and Spitz. (4) Staphylococcus. (5) *Bacillus pyogenes* (possibly a causative organism).

II. Infections by mycelial organisms, showing no granules, or no granules with clubs. (6) Due to unclassified organisms (streptothrix).

Dr. Colebrook suggests the term "actinophytosis" to cover the whole of Group I., but Mr. T. J. Bosworth, before speaking of actinomycosis in animals, deprecated the use of the term in veterinary practice as suggesting a connexion between several quite distinct conditions. He used "actinomycosis" and "actinobacillosis" as separate terms, and included all other lesions of a similar nature under the heading of "botryomycosis," irrespective of club-formation in the granules. Actinomycosis, due to *Actinomyces bovis*, causes lesions of the jaw in animals, and is rare elsewhere. It does not involve the lymph glands, though these often become enlarged owing to chronic adenitis. Actinobacillosis, due to the bacillus of Lignière and Spitz, is more common than actinomycosis in animals, and usually affects the head and neck; more rarely the skin, lungs, liver, and intestine. This condition involves the lymph glands. "Botryomycosis" usually affects the udder only in cattle, and the differential diagnosis is from tuberculosis; in swine it affects the passed along the lumen of the laryngoscope in order to obtain material for culture.

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[1] Proc. Roy. Soc. Med. (Hist. Sect.), 1929, xxiii., 11.

If suction is to be applied an aspirating tube is passed until its tip lies about an inch beyond the vocal cords. These suction tubes are of a special make and cannot be obtained from the ordinary instrument-maker. They are plain brass tubes 14½ inches long and, about six inches from the proximal end, they are bent at an angle of 140 degrees so that the surgeon's hand does not obstruct his view. The proximal part is widened to make a handle, on which is provided a nipple for connexion with the rubber suction tube. The tip of the tube is carefully bevelled off. Like the laryngoscopes, the tubes are unplated. They are used in three sizes: (1) small; internal diameter of main stem 3 mm.; external diameter, 5 mm., internal diameter of tip 2 mm., and external diameter 4 mm.; (2) medium; external diameter of main stem 6 mm.. and of tip 5 mm., internal diameter of tip 3 mm.; (3) large; external diameter of main stem 7 mm., and of tip 6 mm., internal diameter of tip 4 mm. Dr. J. D. Smith, the director of hospitals at the Willard Parker, prefers a special type of tube which resembles a male catheter; it has a blind end, with a hole measuring 10 by 3 mm., placed 12 mm. from the tip. The portable suction apparatus is run off the hospital current and two sets should be available in case of emergency.

Between the applications of the suction tube, water is drawn through it, so that its lumen is kept clear and the surgeon can see how much membrane has been removed. Finally, the larynx is inspected, and if there is a raw, oozing surface it is swabbed with adrenalin.

A supply of sterile laryngeal swabs is kept in readiness for making direct cultures and for applying adrenalin. The swabs are inserted by means of clamped artery forceps. To prevent the wool becoming detached in the larynx the pledget is fixed to the swab stick by collodion.

The nose and mouth of the operator are protected by a mask and his eyes by plain glass spectacles. The whole operation only takes a few minutes and should not cause the patient more than a little discomfort. No anæsthetic is necessary. As soon as the procedure is finished the patient is sent back to bed and given diphtheria antitoxin.

Advantages of Aspiration.

The first advantage claimed for this method is the accurate diagnosis which can be made after direct inspection and direct culture. The diagnosis also aids prognosis; the workers at the Willard Parker Hospital believe that laryngeal diphtheria has a better prognosis than other forms of acute laryngitis with obstruction. Secondly, the direct removal of the membrane by suction restores the air-way which has been partly or completely blocked by it. At the stage at which patients usually come to hospital the membrane is detached easily and there is little œdema and no hæmorrhage. Earlier in the illness there is usually a good deal of œdema and the membrane is very adherent; if the symptoms are not urgent expectant treatment is adopted. Later in the illness, when relief is urgently needed, direct intubation is performed, but suction, its supporters claim, often obviates the necessity for intubation, and in any case diminishes the incidence of broncho-pneumonia.

Dr. Joe's report gives the tables which he was able to compile from the records of the Willard Parker, Kingston-avenue, and Queensboro Hospitals. These institutions have 864 beds between them. Unfortunately the figures only date from 1927. At the Willard Parker Hospital there was a progressive decrease in the death-rate of intubated cases of diphtheria from 54 per cent. in 1922 to 25 per cent. in 1926, followed by a considerable drop—to 16·6 per cent.—in 1927. Making allowance for the reduced severity of diphtheria from 1922 to 1926, Dr. Joe thinks that at least part of the decrease was fairly attributable to the introduction of the suction method. Since 1927 the percentage of mortality has shown an increase to 28·5 in 1928, and 37·5 in the first nine months of 1929. Dr. Joe points out that these figures are not quite fair to the suction method, as they only represent the percentage of deaths after intubation, and the suction method has been steadily reducing the number of cases which require intubation. Moreover, the increasing accuracy of diagnosis may also be related to the increased death-rate. The figures do not supply an answer to the question of how far the new method has reduced the need for intubation. Before 1927 laryngeal diphtheria was not separated from the other cases of diphtheria, but there has been a steady fall in the percentage of all cases of diphtheria which required intubation. Since Dr. Joe's return to England he has received from Dr. Smith the information that in the year 1918–19 the Willard Parker Hospital admitted 697 cases of croup, and that of these 286, or 41 per cent., required intubation, while the mortality after intubation was 41·6 per cent. In 1928, 407 cases of laryngeal diphtheria were admitted; of these, 77, or 4 per cent., only were intubated.

Cases Seen Personally by Dr. Joe.

Of the 11 cases seen by Dr. Joe while he was in New York six were finally diagnosed as laryngeal diphtheria. Two of them were not treated by suction as there was no membrane in the larynx; two more had a moderate amount of obstruction, but Dr. Joe remarks that he would not have considered them serious enough for operative interference, while the remaining two were very severe, and he would have performed tracheotomy or intubation on them at once. The two milder cases gradually recovered without any dramatic alleviation of their symptoms, but the two severe cases demonstrated the value of the aspiration method very forcibly, and Dr. Joe gives the details of them.

The first was a boy, aged 5, who had extensive membrane on the fauces, and was exhausted and livid, with a rapid, thready, pulse and marked recession of the soft parts. Laryngoscopy revealed a good deal of membrane on the epiglottis and larynx and flapping about in the trachea. On the first application of suction, several pieces of membrane were brought out, and the second application removed a complete cast of the trachea and proximal half-inch of both bronchi. All obstructive symptoms disappeared, the patient's colour and pulse improved, and he was asleep when carried out of the theatre. Symptoms of moderate obstruction appeared again 22 hours later; aspiration was repeated, several more fragments removed, the symptoms again completely relieved, and recovery was uneventful.

Dr. Joe's conclusion is that the method is safe and involves, in the hands of a skilled operator, little more than temporary discomfort, and certainly much less shock than tracheotomy. He sees no reason why aspiration should not be employed as an adjunct to tracheotomy as well as to intubation.

WESTMINSTER HOSPITAL.

OPENING OF THE RADIUM TREATMENT ANNEXE.

THE Radium Annexe, which was formerly opened by Viscount Lee of Fareham last Wednesday, Jan. 29th, at 66, Fitzjohn's-avenue, London, N.W., owes its origin to the fact that while public recognition of the value of radium was still lacking two munificent gifts, one from Mr. Austin Taylor, later chairman of the hospital, the other from the Prudential Assurance Company, enabled progress to be made in 1925 with the radium treatment of certain types of cancer. The house committee of the hospital desiring, in 1927, to make the treatment available to all who might benefit from it, an appeal for funds realised nearly £25,000, which was immediately used for the purchase of radium, and by the end of 1928 the hospital possessed three-quarters of a gramme in the form of needles and one gramme which could be used as a unit for the treatment of forms of cancer which had hitherto been regarded as beyond surgery. The problem of accommodation for the increasing numbers of patients then arose, and it became clear that further progress depended upon the coöperative efforts of teams of specialists and surgeons, pathologists, radiologists, physicists, and technical engineers, all working together under one roof. To meet this twofold need it was resolved to establish a separate Annexe, and this was partially made possible by two anonymous donations of £4000 and £5000 each. A building in Fitzjohn's-avenue, Hampstead, was purchased, and plans were made for its adaptation and equipment. Funds were quickly forthcoming, and there is a list of 845 founders, headed by the name of H.R.H. the Prince of Wales. The National Radium Commission recently decided to entrust to the hospital four grammes of radium, on loan from the Union Minière Belge, for use in a single unit. This "bomb" has now been purchased by the Radium Trust and will be in use day and night at the Annexe.

Accommodation.

In the *basement* is (1) a pathological laboratory, in which portions of growth are microscopically examined to determine their original nature and the effects upon them of radiation; examinations of blood are also conducted to serve as a measure of the amount of radiation received by a patient—experimental work on the genesis of cancer is being undertaken; (2) a biochemical laboratory: determination of a patient's tolerance to sugar is here conducted as a measure of his or her reaction to irradiation—an investigation into the cause of cancer from the point of view of the action of fat-soluble agencies is also being carried out; and (3) a physics laboratory: here research is being conducted with a view to the determination of the best means of utilising the supply of radium both in the "bomb" and in the form of needles in order to obtain the maximum destructive power on a growth without injury to the normal surrounding tissues. Here is also (4) the emanation room, containing apparatus for the preparation of radium "seeds," and (5) the deep X ray set room, containing the apparatus necessary for generating at 230,000 volts the X rays used in the deep therapy departments.

On the *ground floor* is (1) the radium bomb room, lined with barium for the protection of workers in adjacent rooms; by means of specially constructed apparatus its rays are directed on two patients simultaneously; (2) the deep X ray therapy department for the irradiation of deep-seated malignant growths, to be compared with irradiation by means of the bomb; (3) the X ray diagnostic department, chiefly used for locating and localising tumours preparatory to their treatment; (4) the dark room, the walls of which, in accordance with modern practice, are painted cream and all work is done by reflected light. On this floor is the male ward with six beds and the female ward with four beds for those unable to contribute, as well as the medical officers' consulting room.

On the *first floor* are seven rooms for the accommodation of paying patients, one three-bedded and one two-bedded ward for the accommodation of those able to contribute not more than £3 3*s*. to £4 4*s*. per week (no medical fees being charged); also the operating theatre, sterilising room, and anæsthetic room.

On the *second floor* is accommodation for two sisters, ten nurses, and four maids. The nurses have their dining and sitting rooms on the ground floor.

Opening Ceremony.

In asking Lord Lee to open the Annexe, the chairman of the hospital, Mr. K. A. Wolfe Barry, said that although separated geographically, the Annexe would be as much a part of the hospital as any ward or special department of the main building. Their surgical staff, after visiting those centres on the Continent where, radium treatment of cancer was being practised, had persuaded the governors of the hospital to take their courage in both hands and to establish a separate department where, alongside treatment by all radium methods, research might be carried out not only into the cause of the disease but also, what was as important, into improved methods of technique. The building, with 22 beds for patients, special rooms for a radium bomb and deep X ray therapy, a theatre, accommodation for the nursing and domestic staff, and all the necessary laboratories for routine and research purposes, was being opened free from debt, although they were not without anxiety for maintenance and running cost. If they had the means they would house the nursing staff in an adjacent building and give up the top floor to further accommodation for patients. This was, he added, the first time that such a mass of radium as four grammes had been used as one unit in this country, and the hospital was proud to be entrusted with it.

Administrative Committee.

The committee which has been selected to administer the Annexe consists of eight members, two of them being surgeons to the hospital—namely, Mr. R. H. Thorpe (chairman), Mr. H. M. Clowes (vice-chairman), Mr. Wolfe Barry and Lieut.-Colonel H. C. Bulkeley (ex officio), Mr. William Turner, F.R.C.S., Mr. E. Rock Carling, F.R.C.S., Mr. J. D. C. Couper, and Major S. R. Stott.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

Medical Research.

THE recommendation of Sir Walter Fletcher's Committee that Dehra Dun should be selected for the Imperial Research Institute seems now to have been definitely adopted, in spite of the local claims of the presidency towns. There has been acrimonious discussion in the Legislative Assembly and elsewhere, and no doubt there would be advantages in the vast amount of clinical material which the hospitals in the large cities are in the position to supply, but the existing research laboratories in Calcutta, Bombay, and Madras will still have their opportunities, and the recently issued report for 1928 of the Haffkine Institute in Bombay furnishes a good example of the variety of work with which they have to deal. During the year under report the Institute has been investigating sprue, various forms of anæmia (particularly in relation to pregnancy), and tuberculosis. An inquiry has been conducted into the possibility of improving the mode of preparation of plague vaccine, with which Bombay supplies the whole of India, and the examination of indigenous drugs, which has now been going on for some years has been continued, as well as an inquiry into the factors which give rise to earth-eating. The plague investigation has not led to any modification in the process of manufacture, but as so often happens in such cases a result has been indirectly arrived at which will prove very useful. The discovery that blood agar is the best medium for the growth of the plague bacillus has facilitated the detection of contaminating organisms in the vaccine. Anæmia is very prevalent in Bombay, and the researches have shown that the forms associated with sprue and pregnancy bear a close resemblance to pernicious anæmia. It is thought that the anæmia of pregnancy is not a distinct entity, as has sometimes been suggested. The Institute also serves as a centre for antirabic treatment. The report closes with an expression of regret that the Institute is still cramped for funds, and that no further advance has been made in the direction of establishing a school of tropical medicine in connexion with it.

Cholera in a Hill Tract.

Evidences of progress in medical work are to be seen just now in the Punjab, where a large number of fresh rural dispensaries have been established during the last few years, and the public health report of the province for 1928 is full of interest. The year was an exceptionally healthy one, the death-rate being 24·72 per mille, as against a birth-rate of 40·30—

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Death of Dr. Thomas Dowse.

One of the most highly respected practitioners in the south-east of Ireland, Dr. Thomas J. Dowse, of Wexford, has recently died. He obtained his medical degrees from Dublin University in 1881, and spent his professional life in Wexford, where he was physician to the County Hospital. He was a man of high professional skill, punctilious in his attentions to his patients, and generous and courteous in his treatment of the poor. He was held in universal esteem in Wexford by all classes of the community, as well as by his professional brethren. He came of a family which has given many members to medicine, while others have reached high offices in the Church.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The Universities in Public Administration.

IN a recent address to the Institute of Public Administration, Dr. T. J. Mackie, professor of bacteriology in the University of Edinburgh, pleaded for a more extended use of Universities and University staffs in the health and research work of the public authorities. Problems, he said, were continually confronting our governing authorities, central and local, in which expert assistance was required beyond the scope of their own permanent officials. The names of University professors were often to be seen among the members of Royal Commissions and Government Committees, and investigations of public importance were sometimes referred to University experts; but he wondered whether the full possibilities of the Universities in this respect were perfectly appreciated, and whether the knowledge of University workers was utilised sufficiently in the common good. In the Universities the central and local governments could find a wide choice of advisors, consultants, and investigators for the very various problems which every day beset them.

Prof. Mackie also discussed an urgent question of the moment—namely, the relation of the new hospital organisation to the University medical schools—and suggested that it might be to the advantage of certain local authorities to enlist medical school coöperation in the medical management of their new municipal hospitals. In recent years, the medical schools had recognised that remedial measures and prophylaxis through research must go hand in hand. Some of them had attempted to institute full-time professorships in the main clinical subjects, so that the occupant of the chair might devote himself entirely to hospital work, teaching, and research. Was it not possible that in University centres the hospitals of the future might be most effectively staffed—in the interests of the public, of medical education, and of research—by a whole-time medical school personnel, and so become still greater centres of progressive medicine—in short, University hospitals?

Prof. Mackie's paper will, no doubt, be published in full. He strikes the same note as many of the younger men in the medical profession who look forward to a closer integration of teaching, research, and administration, as against the policy hitherto favoured by the voluntary bodies of strict independence and reservation of offices for the men in so-called "consulting" practice. Views are far from unanimous, and much is to be said from each side; but we have reached the moment for a radical discussion of the possibilities of "coöperation," if only to meet the rising demand for more treatment and more investigation of disease on the extended scale open only to well-equipped institutions.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 18TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 414 (last week 335); scarlet fever, 2068; diphtheria, 1819; enteric fever, 44; pneumonia, 1204; puerperal fever, 72; puerperal pyrexia, 119; cerebro-spinal fever, 8; acute poliomyelitis, 5; encephalitis lethargica, 19; continued fever, 1; dysentery, 7; ophthalmia neonatorum, 96. No case of cholera, plague, or typhus fever was notified during the week.

Fresh small-pox cases, while fewer in London than in the previous week, were more numerous in some other counties and were more widely distributed. Derby reported 1 (R.D. Chesterfield): Essex, 54 (East Ham, 1; West Ham, 36; Walthamstow, 11); Hertford, 1 (East Barnet Valley); Leicester, 68 (42 in the County Borough); Middlesex, 4 (Tottenham, 3; Wood Green, 1); Northampton, 1 (Rothwell); Peterborough, 1 (Borough); Sussex East, 6 (Eastbourne); Warwick, 3 (Coventry, 1; Nuneaton, 2); Yorkshire West Riding, 70 (Dewsbury, 3; Halifax, 4; Huddersfield, 13; Leeds, 31; and in urban districts, Batley, 9; Birstal, 5; Rothwell, 20; Spenborough, 9.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Jan. 21st–22nd was as follows:—Small-pox, 528 under treatment, 18 under observation (last week 503 and 33 respectively); scarlet fever, 2482; diphtheria, 2682; enteric fever, 23; measles, 917; whooping-cough, 124; puerperal fever, 30 (plus 10 babies); encephalitis lethargica, 119; poliomyelitis, 2; "other diseases," 16. At St. Margaret's Hospital there were 15 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns including London there was 1 death from small-pox, 3 (1) from enteric fever, 60 (22) from measles, 10 (3) from scarlet fever, 18 (1) from whooping-cough, 62 (12) from diphtheria, 59 (17) from diarrhœa and enteritis under two years, and 67 (15) from influenza. The figures in parentheses are those for London itself.

Small-pox was mentioned as a cause of death in a case assigned to the Metropolitan Borough of Shoreditch. (The returns for December, just received, include a fatal case provisionally classed to small-pox at Rawmarsh U.D. Yorks W.R.) The two cases of enteric fever outside London were both reported from Manchester. Six fatal cases of measles were reported from Wigan, 5 from West Ham, and 3 from Manchester. Leeds reported 3 fatal cases of scarlet fever, Newcastle-on-Tyne 3 of whooping-cough. Fatal cases of diphtheria were widely distributed: Ipswich and Liverpool each 4, Southampton, Bristol, Birmingham, and Hull each 3. Liverpool had 7 deaths to report from diarrhœa, Manchester and Newcastle each 4. The highest figures for influenzal deaths are reported from Birmingham and Manchester each 6.

The number of stillbirths notified during the week was 311 (corresponding to a rate of 47 per 1000 births), including 55 in London.

Fatal Case of Small-pox.—The death mentioned above was that of a boy 10 years of age, unvaccinated, who became ill with headache and sickness on Dec. 29th. Spots first appeared on Jan. 4th or 5th. Dr. Maitland Radford, medical officer of health for Shoreditch, tells us he was asked to see the boy on Jan. 7th, when he found a typical small-pox (mild type) eruption, the boy seeming much more ill than is usual with this type of case. The boy died on Jan. 12th in the Joyce Green Hospital, the cause of death on the certificate being stated: (*a*) encephalomyelitis, (*b*) small-pox.

BOLINGBROKE HOSPITAL.—This institution, at Wandsworth Common, last year treated 2252 in-patients and 13,022 new out-patients. The average residence in-patients was 15·8 days.

Correspondence.

"Audi alteram partem."

EARLY DISCHARGE OF SCARLET FEVER CONVALESCENTS.

To the Editor of THE LANCET.

SIR,—In your interesting survey of the Reports of Medical Officers of Health for 1928 you observe, under the heading of Infectious Diseases, that "the use of antitoxin for *scarlet fever* is reported upon favourably, and several isolation hospitals claim to be discharging scarlet fever cases after 28 days without harmful results." The suggestion is that the use of the serum has enabled the discharge of patients at the end of so short a period. May I be permitted to point out that 29 years ago at the Eastern Hospital, Homerton, I began the practice of discharging all mild and uncomplicated cases of scarlet fever at the end of four weeks (see Annual Report of the Metropolitan Asylums Board for the year 1903, page 208 and page 177)? And I continued it till I retired in 1926.

Nor was I alone in this practice. The late Dr. J. B. Curgenven had forestalled me in 1890, and he was followed by the late Dr. Robert Milne. They both attributed the safety of the discharge of scarlet fever patients on an earlier day than was customary to the use, chiefly, of eucalyptus oil. They were both right in their practice but wrong in their explanation of its safety. Most of us were in those days under the influence of the fetish of the supposed infectiousness of the peeling cuticle, and were too timid to move against custom. I should not be surprised to hear that it was safe to discharge some scarlet fever patients before the end of the fourth week, quite apart from the use of serum. But the use of serum, by hastening recovery and preventing complications, should lead to the early discharge of a larger number of scarlet fever patients than heretofore.

I am, Sir, yours faithfully,
E. W. GOODALL.

Hemingford Abbots, Hunts, Jan. 26th, 1930.

CHEST COMPLICATIONS AFTER OPERATION.

To the Editor of THE LANCET.

SIR,—In Dr. C. J. Fuller's paper and a leading article in your issue of Jan. 18th the incidence of post-operative chest complications was discussed. Diaphragmatic inertia was shown to be one of the causative factors and, in order to counteract this, respiratory exercises were prescribed, but the practical results from these fell far short of anticipation. As regards these exercises, full expansion either of both lungs simultaneously or of single lungs alternatively was attempted; diaphragmatic movement at the culmination of a thoracic breath was aimed at. The fact that there is an alternative method which is an extremely simple one to teach has led me to presume on your valuable space.

Sir Arthur Keith (1909) showed that the upper lobes are chiefly expanded by the upper ribs. He analysed the diaphragm into the crura and the sterno-costal portion, the former acting chiefly through the roots and on the apices of the lungs. Sir Charlton Briscoe (1920–27) expanded this conception and utilised contraction of the dome of the diaphragm to aerate the lower lobes of the lungs. As regards the interplay of the alternative respiratory muscles he considered that, according to Blix's law, "stretch" was the determinant. Lady Briscoe (1928) in some beautiful laboratory experiments demonstrated selective activity of the dome and crura of cats by alteration of position of the spinal column, the criterion being that extension of the spine readjusted the relative "stretches" of the crura and dome in favour of the former.

Prof. Wood Jones (1913) showed that anchorage of the alternative respiratory muscles in accordance with posture determined the breathing mechanism that predominated in various animals. Utilising the above information I have been using selective breathing movements, when re-educating the abdominal wall, and more recently, when dealing with bed-patients convalescing from abdominal operations. From the point of view of treatment the abdominal wall and diaphragm are a convenient pair (prime-mover and antagonist); selective breathing movements fulfill the desiderata: "little and often," relaxation of the antagonist, selection of the "true function" (Mackenzie) and a suitable task for a damaged muscle, all of which are laid down by Dr. J. B. Mennell in connexion with muscle re-education. The forcible exercises given to Dr. Fuller's patients contravened the principle that "no enfeebled muscle should ever be stretched" (Mennell).

When re-educating the diaphragm, an initial expiratory movement should be made by a slow coördinated contraction of the abdominal wall; this anchors the periphery of the dome of the diaphragm and gives the muscle adequate "stretch." Coördination of the abdominal wall and avoidance of thoracic movement come easily, if the patient lays his hands on the chest and on the abdomen, both on the binder and free areas. These movements, if sufficiently controlled, will be found painless and are popular with patients, as they often help flatulence.

I am, Sir, yours faithfully,
J. K. McCONNEL.

Clifton Hill, St. John's Wood, Jan. 23rd, 1930.

MUSCULAR MOVEMENTS OF THE COLON.

To the Editor of THE LANCET.

SIR,—In his informative article on radiography of the colon (THE LANCET, Dec. 28th, 1929, p. 1377), Dr. Barclay tells us that movements corresponding to ordinary peristalsis are not seen on the fluoroscopic screen, but only mass movements occurring a few times per day. It is difficult to reconcile this interesting statement with clinical experience, authoritatively rendered as it is by an experienced radiographer. For example, frequent colonic movements are experienced by everyone in slight intestinal disturbances, following the taking of a laxative, in the dispersion of bowel flatulence, and so forth. Are we to understand that these movements are all of the mass movement type? Clinically they appear to be ordinary peristalsis. One thinks, too, of visible peristalsis in chronic intestinal obstruction. Perhaps Dr. Barclay would be good enough to explain the point. I am, Sir, yours faithfully,
L. J. GREEN.

High-road, S. Tottenham, N., Jan. 19th, 1930.

COMPULSORY TREATMENT OF VENEREAL DISEASE.

To the Editor of THE LANCET.

SIR,—Any opinion advanced by Dr. Sequeira deserves careful consideration, and his letter in your issue of Jan. 18th is very much to the point. Two years ago I contributed [1] to a correspondence in THE LANCET that took place regarding the venereal campaign and referred to the Edinburgh Bill, when I expressed the opinion that while a great teaching centre and medical school like Edinburgh, to which preventive medicine owes so much, might safely be permitted to carry out a local experiment in prevention by compulsory treatment, I personally, in view of the wide divergence of medical opinion as to what constitutes effective treatment, did not consider legislation enforcing treatment practical or desirable *except for a short minimal period of three months*, which should be sufficient in the great majority of, but of course not in all, cases to render the patient non-contagious.

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[1] THE LANCET, 1928, i., 883.

Such a minimal course of compulsory treatment for syphilis or gonorrhœa would not, I gather, offend Dr. Sequeira and those who think with him, and might be accepted as a compromise by the advocates of compulsory treatment. Three months compulsory treatment for syphilis and three months compulsory treatment or attendance for observation for gonorrhœa (for most cases of the latter are cured in less than three months) would do much good and little, if any, harm.

I am, Sir, yours faithfully,

H. WANSEY BAYLY.

Harley-street, W., Jan. 22nd, 1930.

MENTAL TREATMENT BILL.

To the Editor of THE LANCET.

SIR,—In your leading article (Dec. 7th, 1929), commenting on Clause 2 (1) of Lord Russell's Bill, you say:—

> If a person with mental disturbance voluntarily asks for treatment in a hospital or home, why should he, more than any other invalid, have to be notified to the Board of Control? . . . It is obvious that those in charge of such patients, let alone the patients themselves and their relatives, will object to compulsory notification. . . . We trust that obligation to notify all voluntary mental patients will be withdrawn, and discretion left to the medical man responsible for the treatment of the patient."

It is evidently for the good of the community that cases of slight instability which cannot be proved to be dangerous or unfit to be at large should be treated on a voluntary footing in places without detention, and that everything should be done to make it easy for them to come to a hospital at an early stage, and *of their own accord;* whereas if they think that they are placing themselves under Lunacy control they are likely to hesitate, and thus the chance of a speedy recovery may be delayed. It is natural also that not a few members of the medical profession are averse to having their uncertified patients compulsorily notified to the Board of Control.

As regards transient cases of high temperature with delirium (e.g., puerperal, pneumonic, influenzal) it is very undesirable to treat such cases in asylums because there is there no qualified nursing staff competent to take charge of patients in such peril of their lives. Delirium subsides in the course of a few weeks, when the patient becomes again normal. The natural way to keep such cases safe from stigma is to treat them as *hospital cases* in homes or hospitals appropriately staffed, and apart from lunacy administration.

If public asylums wish to open their doors to voluntary boarders a short Bill could be brought in for the purpose (as in the case of Maudsley and Dartford). In places where patients know they are *not detained*, the risk of ill-treatment is minimised—as also is the necessity for inspection. It is hoped that the Bill may be amended in respect of Clauses 1–5.

I am, Sir, yours faithfully,

S. E. WHITE, M.B.

Strone-road, Manor Park, E., Jan. 28th, 1930.

MEDICAL FOUNDATIONS.

To the Editor of THE LANCET.

SIR,—I agree with all that Dr. Henry Robinson says. In a letter (entitled Thoughtful Gratitude), from myself, which you inserted last year, I pointed out that when medical men or their families are attended or prescribed for by a colleague, it would be a kindly and useful act if they sent to one of the medical foundations a cheque for a small amount. When one remembers how many medical men find it difficult in these days to save, and how often the widows of medical men are crushed down with poverty and the struggle to provide for their children, it is time that others more fortunate should stretch out a helping hand. The foundations are doing a great work, but they are anxious to do far more. Unfortunately their hands are tied by want of money, and many of us who could help—at least to a small extent—from want of thought or want of feeling, pass by, like the Levite, on the other side, and leave many unfortunate ones to battle on with their cares and their poverty.

I am, Sir, yours faithfully,

Harrogate, Jan. 20th, 1930. JAMES G. MACASKIE.

NEPHROSIS AND NEPHRITIS.

To the Editor of THE LANCET.

SIR,—In the leading article with which you have honoured my report to the Medical Research Council on A Classification of Bright's Disease you say that the student is left in some perplexity as to why the term nephritis mitis is preferred to nephrosis for one kind of nephritis. Readers will find on pages 119 to 123 reasons for objecting to this particular application by Volhard and Fahr and by Munk of Müller's term nephrosis.—I am, Sir, yours faithfully,

DOROTHY S. RUSSELL.

Bernhard Baron Institute of Pathology, London Hospital, E., Jan. 24th, 1930.

LAENNEC AND THE BRUIT D'AIRAIN.

To the Editor of THE LANCET.

SIR,—Despite "Bobo," it would seem that "Anglo-Gallicus" is really right. The name of the Breton physician should be spelt *Laennec*, as he wrote it and as he printed it on his book-plate. It is thus spelt on his monument, and, for us, in Gee's classic work. The wrong fashion, with a diæresis over the first "e," became official, as "Bobo" hints, about eighty years ago. But the French Academy in these later years has formally recanted, and all future editions of the invaluable and pleomorphic "Larousse" will conform to what is now correct, officially and unofficially. With a reversion to correct spelling, there will doubtless come about a general reversion to the pronunciation that so many accomplished Frenchmen have always preferred to the "trisyllabic" one.

Again, both "Anglo-Gallicus" and "Gallo-Britannicus" seem to be right in insisting that, to-day, *airain* be always translated as meaning either (1) bronze, or (2) an object, such as a bell, made of bronze, unless a frankly metaphorical usage is implied. The archaic, or at any rate, Elizabethan and Jacobean use of *brass*, indiscriminately, for all copper alloys, is interesting historically, but irrelevant save as an excuse for confusion.

Gee was clearly right in saying that the *bruit d'airain* does not require a coin for its production, and in translating the expression by its exact English equivalent—"bell-sound." When Trousseau spoke of the *bruit d'airain* he surely had in mind the sound so familiar to everyone who has lived in a French village and has listened, at night from his bed, or by day from the hills, to the single "strike" of the bell in the steeple.

Dr. McLaughlin and Dr. Dix-Perkin have explained to us why it was only, *par moment*, that Laennec, when practising auscultatory percussion over a pneumothorax, heard the *tintement* that *so exactly* recalls this characteristic "sound *of the bell*." For this we should be very grateful to them.

I am, Sir, yours faithfully,

F. G. CROOKSHANK.

Wimpole-street, W., Jan. 25th, 1930.

SPINAL ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—Sir Francis Shipway pointed out in his letter last week that to sit a patient up for fear a heavy solution used to produce spinal anæsthesia should "go to the brain," is an entirely obsolete and erroneous technique. Erroneous it may be but it is not quite obsolete. I saw it practised myself in one of the capitals of Europe no longer ago than last May. It was not, however, its antiquity or its error to which I particularly wished to draw attention, but the fact that it had given origin to a certain fear, the fear of a fall of blood pressure. It seemed to me that to trace the origin of this fear would be the best way to dispel it.

Turning to the letter of Dr. Howard Jones, I do not think he distinguishes with sufficient nicety between the Pitkin method and the arguments supporting that method. He says he rejected it on theoretical grounds. I would rather put it that the theoretical grounds should be rejected but the method given a prolonged trial. Pitkin's claims are exaggerated and some of his statements are demonstrably incorrect, and the excellence of the method is obscured and brought into disrepute by such extravagance. Surely a method which may reasonably be expected to give complete muscular relaxation for one and a half hours, with a degree of safety, all things considered, at least equalling that of general anæsthesia must have a very large sphere of usefulness. Novocain is the safest spinal anæsthetic we know, the gliadin tends to keep the solution together and delays absorption, thereby diminishing toxicity and prolonging the effect, both very important points, and the alcohol makes the solution lighter. Though this quality of lightness may be of no physical importance, in the present state of opinion it has very definite psychological value.

Dr. Jones says, "Most people will agree that spinal analgesia results either from a simple nerve block across the cauda equina or in the dorsal region from root block." Certainly, but neither of these processes seems to be adequate to explain the phenomena observed in the case I described. This patient felt no pain at a time (20 minutes) during which muscular rigidity was increasing after having been completely in abeyance for 40 minutes. I therefore concluded that the path of pain to the brain was blocked. Where? Is it possible that:—1. The rigidity was due to the unblocking of the efferent half of the reflex arc alone? If so, what stimulated the muscles to action? 2. Impulses passing from the seat of operation up the afferent half were responsible for the stimulus to the muscles but conveyed no pain stimulus. Both these conceptions seemed so difficult that I ventured to suggest that the anæsthetic, some of which we knew to be in the higher dorsal region, was there blocking the spinothalamic tract. It still seems to me the most likely explanation.

One more point. Dr. Jones credits me with a theory that I am unable to identify; it seems to involve the carrying on of breathing by means of the respiratory centre in the presence of paralysed phrenics. We inject novocain into the spinal theca, the abdominal muscles are completely paralysed. If the novocain goes above the third and fourth cervical, why is not the diaphragm paralysed? I suggested that novocain paralyses receptor mechanism only; that the abdominal muscles are not really paralysed but only flaccid from the complete absence of stimuli. The phrenic centre has a constant stream of afferent impulses coming to it from the respiratory centre, hence the activity of the diaphragm. There is nothing quite analogous in the case of the abdominal muscles.

I am, Sir, yours faithfully,

Manchester, Jan. 27th, 1930. E. FALKNER HILL.

MEDICINES IN THE MASS.

To the Editor of THE LANCET.

SIR,—We who practice in industrial areas are perhaps better qualified than any to speak of the large consumption of patent medicines in this country to which you alluded in a leading article last week. One sees the shelves and window sills crammed with patent medicine bottles during one's daily rounds. Patients refer to various nostrums which they may happen to be taking irrespective of what particular medicine they may be getting from oneself as their family doctor.

The high incidence of gall-stones in this neighbourhood makes the vendor of a gall-stone "remedy" a popular figure. Any herbalist down a back street in Bradford or Leeds is apparently far more skilled to "disperse" gall-stones than "the doctor," whose training apparently quite neglected this painful but common malady. One such quack sells a remedy consisting of a bottle of oil and some powders. By taking these, all gall-stones in the patient's body speedily deliquesce and flow easily into the alimentary tract and are voided in the fæces. The patient triumphantly extracts the alleged stones from the fæces and brings them up forthwith to the surgery. One of my patients who had been suffering from renal colic and in whom a stone was afterwards shown by X rays to be lying at the lower end of the ureter, for some mysterious reason—or because I had once suggested gall-stone colic—went and spent 23*s.* for the oil and two powders, and with great glee, a day or two later, brought a number of fæcal-looking lumps in a piece of paper to the surgery. "My gall-stones," he exclaimed, breathless with excitement. Examination showed that they were formed simply by the combination of the oil and powders in the alimentary tract. Only this morning I was told of a woman suffering from no symptoms suggestive of gall-stones, who had taken the above "remedy," and had passed 350 gall-stones!

Is it not time that something was done by Parliament to put down this iniquitous traffic? So long as such a combination of ignorance and credulity exists amongst the masses of this country, so long will the quack flourish. Here in the West Riding where the depression of trade is so acute—patients are apt to remind us of it shortly before the account goes in—it is nothing less than criminal that a working man can be so easily induced to part with 23*s.* for a fictitious cure of a disease which he does not possess.

I am, Sir, yours faithfully,

Jan. 27th, 1930. M.R.C.S., L.R.C.P.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Capts. (Retd.) to be Surg. Rear Admirals (Retd.): H. J. Chater and R. W. G. Stewart.

The following appointments are notified:—Surg. Comdr. L. R. Warburton to *Victory*, for R.N. Barracks, Portsmouth; Surg. Lt. W. D. M. Sim to *Vindictive*.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. J. G. Bell, having attained the age for compulsory retirement, is placed on retd. pay.

Capt. W. O. Holst to be Maj.

E. F. Hunt is granted a temp. commn. in the rank of Lt.

ROYAL ARMY DENTAL CORPS.

Capt. A. A. McMullan to be Maj.

TERRITORIAL ARMY.

Capt. R. B. Rutherford to be Maj.

ROYAL AIR FORCE.

Flight Lt. F. T. Boucher resigns his commission on appointment to a commission in the Royal Army Medical Corps.

Obituary.

PHILIP BOOBBYER, M.D., M.S. DURH.

WE noted last week the death of Dr. Boobbyer within a few days of his retirement from the medical officership of Nottingham, a post which he had filled for forty years. His death occurred suddenly on Jan. 21st, in his seventy-third year.

DR. BOOBBYER.

[Photograph by Lafayette.

Philip Boobbyer was the son of Joseph Hurst Boobbyer and came of Huguenot stock, a fact which may have some relation to the almost religious fervour with which he put through large schemes of social welfare. He was educated at Brighton College with a view to becoming an engineer, but after two years of machine-drawing he discovered his bent was for medicine and went to King's College, London, qualifying in 1881 and taking the higher degrees of the University of Durham some years later. After qualifying he was resident at King's College Hospital and demonstrated anatomy at Newcastle before succeeding Dr. B. A. Whitelegge as medical officer of health for the borough of Nottingham. He was then only 31 years of age and had already for some years been health officer to the Basford Rural Sanitary Authority. The development of health services at Nottingham is practically the record of Boobbyer's forty years term of office. One of its chief landmarks is the abolition of the pail-closet system in the city and the coincident disappearance of typhoid; had Boobbyer had his way the change would have been complete long before, but even a convinced medical officer has to convert his lay colleagues, and the conversion cost the city over half a million. Open-air methods were his great hobby, whether it was a question of letting air into the infant school, the sanatorium, or public places of entertainment. The cottage hospital and school for tuberculous children at Thurgarton was one practical outcome of his enthusiasm, but it was not propaganda or stunts that filled up the bulk of his time for he was fully occupied with the routine work of a sanitary department, the personnel of which increased during his tenure from 30 or 40 to 220. He was also examiner in public health for the universities of Birmingham and Sheffield and the Royal Sanitary Institute. Apart from his annual reports his contributions to medical literature were slight; they included a special report to the Home Office on the health of lace dressers, and articles on the open-air treatment of small-pox and other acute specific diseases. But to understand the principles which infused his work it is only necessary to read the report presented last year to the Nottingham public health authority, in which he sketched the development of local public health measures during the preceding thirteen years.

A colleague in the public health services writes: "I met Boobbyer at the Plymouth Congress in the summer of 1928, when he discussed with his usual keenness the appointment of his successor and seemed to have in prospect a happy period of well-earned retirement. A virile personality, he had strong convictions and was not afraid to express them, when charm of manner and transparent honesty balanced his outspokenness. Long ago a new member of the health committee who questioned his veracity received the unexpected retort, 'If you don't withdraw that statement, I'll come round and pull your nose.' After receiving counsel in an undertone from his neighbour that the medical officer would probably be as good as his word, the member withdrew. In his younger days Boobbyer was no mean athlete. It is related how he and two colleagues, bored with the opening ceremonial of a public health congress in Edinburgh, paid a visit to the Castle where they came upon a sergeant instructing some kilted recruits in putting the weight. Presently the instructor addressed the silk-hatted befrocked trio, 'Perhaps one of you young gentlemen would like to have a try!' Boobbyer accepted the invitation, doffed his coat and hat and threw the weight a good ten feet further than the soldiers. The cold bath before breakfast at the age of 73 (on which his death followed) was typical of a man who preferred to live dangerously. He would not have liked to rust out."

Dr. Boobbyer married a sister of the architect Mr. Watson Fothergill by whom he had two sons and two daughters, all of whom survive him.

ALBERT MORTON MARTIN, M.B., B.S. DURH.,

CONSULTING SURGEON, ROYAL VICTORIA INFIRMARY, NEWCASTLE-UPON-TYNE.

THE death of Mr. Martin on the last day of the old year came as a shock to his numerous friends in Newcastle and district. Though he had not been well for the past two months it was thought that his health was improving and he was at work the day before he died. He had only retired from the active staff of the Infirmary in September last on attaining the age limit of 60 years, and had been looking forward to spending his retirement in the country of which he was so fond.

Albert Martin was born and bred a Northumbrian, and graduated M.B., B.S. Durh. with honours in 1890. After acting as house surgeon to the Ingham Infirmary at South Shields he returned to the Newcastle Infirmary as house surgeon, and soon after was appointed honorary assistant surgeon. His promotion was rapid, so that for 29 years he was full surgeon in charge of wards and the greater part of that time senior surgeon. For a period he was also surgeon in charge of the then existing orthopædic department of the hospital. In private he had an extensive consulting practice, and owing to his special knowledge of diseases of bones and joints his services were in great demand in cases of dispute arising out of the Workmen's Compensation Act.

Mr. J. Hamilton Barclay writes: "Having been Mr. Martin's private assistant for over ten years and having worked with him for long at the Royal Victoria Infirmary, certain characteristics stand out prominently in my mind. First, his wonderful surgical skill. He had, more than almost any one I know, the gift or faculty of making operations look easy and simple. While operations on the bones and joints were his favourite, yet he was perfectly at home in all operations of general surgery, and particularly in the region of the gall-bladder and the pelvic organs. To see him remove a torn semilunar cartilage through a small transverse incision was a revelation. His touch was wonderful; to a casual observer he might at times appear rather rough in his handling, yet I have never known him bruise or lacerate the tissues in his manipulations. Without appearing to he got through a morning list in a remarkably short time and without any fuss. He did not bother with many of the new and elaborate techniques but was satisfied with the technique that had served him so well in the past and the results showed that he was right, for his operation wounds healed perfectly. Secondly, his wise judgment and surgical sense. He was an excellent diagnostician and always seemed to know just when to operate. In my earlier days I was often astonished at his decision to 'sit' on a case overnight when to me it appeared to be urgent; but I soon found he was right. Last, but not least, his wonderfully bright and optimistic temperament. He was always buoyant and cheerful, even in the face of adversity, and he was always considerate and loyal to his juniors and colleagues. Whatever his assistant did in the wards was right. The Infirmary will be a poorer and a sadder place for his loss."

Mr. Martin's wife predeceased him; he is survived by two sons, one of whom has followed his father's profession, and two daughters.

Dr. **William Eidinow**, who died on Jan. 23rd, was 34 years of age, and qualified as M.R.C.S. Eng. in 1917 from the London Hospital, where he held the appointments of emergency officer and surgical clinical assistant. He served from 1917 to 1920 with the rank of Captain in the Royal Army Medical Corps, in France, Italy, and Montenegro, and was awarded the Italian Silver Medal for Valour. After demobilisation he took up a busy practice amongst the working classes of Islington.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Collecting Charities (Regulation) Bill.

The debate on the second reading of the Collecting Charities (Regulation) Bill was resumed in the House of Commons on Tuesday, Jan. 21st.

Mr. **E. Brown** said that this was a measure to provide for the investigation and regulation of charities that appealed to the public for support. It fell into three main parts. Clause 1 gave power to the Charity Commissioners to inquire into the affairs of collecting charities. Clause 2 gave power to the Charity Commissioners to regulate collecting charities. Clause 3, which required to be turned inside out, might gravely injure certain operations of trade-unions. It provided that the Home Secretary might make regulations—unspecified and unstated—enabling him to do three things: (*a*) He might permit persons to make or cause to be made visits from house to house for the purpose of making appeals for support for any collecting charity. (*b*) Persons might be permitted to make, or cause to be made, in places of public entertainment or public refreshment collections for any collecting charity. (*c*) Any collecting charity might cause collecting boxes to be exhibited in any shop for the purpose of making appeals for support for the charity. What would be the position of organisations which might be formed for perfectly good causes if this Bill became law? The Home Secretary had received a deputation from the larger collecting charities, and he (Mr. Brown) understood that the right hon. gentleman had made an arrangement with them. But what would be the position of the smaller charities not represented on the deputation? Unless the House could get assurances about the form of Clause 3 it should, in his opinion, hesitate to give a second reading to the measure, because Clause 3 was so vague in its drafting that it constituted one of the worst samples of legislation by reference that the House had ever been asked to pass.

Sir **Kingsley Wood** said that this was an important Bill affecting the great charitable institutions of the country, and it called for scrutiny from every member of the House. A number of charities which called themselves national charities had been in communication with the Home Secretary at various conferences and had made certain objections to the provisions of the Bill. The Home Secretary had made some suggestions by way of meeting their difficulties. But the House ought to protect not only the national charities, but also the many small charities operating in particular localities. It appeared that if any county or county borough council liked to make representations to the Charity Commissioners, not on specific grounds, but because they had some sort of objection or complaint as regarded a specific charity, the Commissioners, without—at any rate for the moment—any specific right of appeal to any court of law, could put into operation the very drastic powers contained in the Bill. They could order any bank which happened to have the money of the charity to withhold payment to the people who actually invested their funds there, and could order the particular charity to be wound up. That was a very drastic power to give. The Departmental Committee on this subject had found that out of 80,000 charities only about 100 could be said to be preying on the public. That hardly justified the drastic provisions of this Bill. The London County Council took the view that if there was any question about the administration of charities they should be required to satisfy a competent authority and become registered. The Bill would have to be examined very carefully indeed in Committee. He hoped that the Home Secretary would see that nothing was done to interfere with the beneficent work of the very large number of small and large institutions of a charitable nature up and down the country.

Effect of Clause 3 on Finances of Charities.

Mr. **Philip Oliver** said that this Bill was considered, and especially the provisions of Clause 3, by the Northern Association of Hospital Secretaries last October. The Association was a very responsible body, and the meeting was the largest attended gathering that it had held. The secretaries and superintendents of 30 hospitals were present from towns like Manchester, Liverpool, Warrington, Bradford, Leeds, Sheffield, Hull, Chester, Stockport, and Oldham. The secretaries of all the great infirmaries and hospitals of these towns were very much perturbed indeed as to the effect of Clause 3 on their finances. A big hospital would almost certainly have what was called a workpeople's fund committee. Collections were made from door to door. There were other hospitals which had beds or cots supplied by particular districts. The person responsible was somebody who lived in the district. Under this Bill the regulation must provide that "no such visits or collections shall be so made or caused to be made . . . as aforesaid except by persons licensed for the purpose by such officer of the police as may be designed for the purpose." When the Bill was printed he (Mr. Oliver) went to see the secretary of one of the big Manchester hospitals, and asked him what the effect of that provision would be upon their voluntary collectors. He replied that they would refuse to go to the police at all. Why should voluntary collectors, giving up their spare time for this work, go to the police to be licensed? There was absolutely no justification for such a proposal. Another gentleman, who was secretary of a large body known as the Manchester and Salford Medical Charities Fund, had stated that the effect of this measure would be to cause sensitive-minded collectors to throw up the job. These considerations were very gravely perplexing the minds of those responsible for the big hospitals of the country. Why did not the Home Secretary, instead of producing this Bill with supervision, extend the existing legislation to charities which were not controlled by that legislation? The War Charities Act prohibited appeals by any charity unless it was registered, usually by the local authority. No charity was allowed to be registered unless it had a responsible committee of not less than three persons, unless it kept proper books of account, and unless those books were open to inspection. That was a perfectly rational system of control. Police supervision was very objectionable, and in any case would cast a heavy burden on the police themselves.

Amendments Promised in Committee.

Mr. **A. Short** (Under Secretary for the Home Office) said that in this Bill the Government were seeking to meet the demand put forward not only by the charitable organisations themselves, but supported by the recommendations of the Departmental Committee. The Home Secretary recognised that Clause 3 was by no means perfect. It rightly gave rise to anxiety and to questions founded on a desire to protect the interests of these great charitable organisations. His right hon. friend would be prepared in Committee to make drastic amendments to meet the views of the House as expressed in all quarters, and thereby secure, if possible, unanimity when the Bill passed through the Committee stage. It was proposed to amend the Bill so as to permit an appeal to be made to the High Court against an order of the Charity Commissioners for the regulation of a charity under Clause 2. They also proposed to permit an appeal to Quarter Sessions against a refusal to license on the ground of fraud or maladministration of the charity itself. The regulations would apply to all charities, but the war charities which were now governed by various Acts of Parliament would be exempted as provision would be made by amendment. The regulations would be based in principle on the recommendations of the Departmental Committee and would be in the form of those made by the Home Office, under the Regulation of the Street Collections, Police, Factories (Miscellaneous Provisions) Act, 1916. All charities, national and local, would be subject to the regulations. So far as the refusal of licences was concerned, they did not desire to cripple new enterprises, and they hoped to prevent an arbitrary refusal of licences and to ensure that they were not refused on arbitrary grounds. To prevent any discrimination against new enterprises, licensing officers would be required to grant a licence unless the person in respect of whom the application was made was under 21 years of age, was of bad character, or otherwise not a fit and proper person to be a collector, or where the charity was not being carried on in good faith for charitable purposes, or was not being properly administered, or was not keeping proper accounts of receipts and expenditure. The Home Secretary was most anxious that the regulations should be drawn in a broad and generous spirit, and that nothing in them should be calculated to cripple charities, national or local, which were above suspicion and where there was no suggestion of fraud. The regulations would be drawn in such a way as not to interfere with the creation of new charities. They would seek the coöperation of the great charitable societies, and would welcome the advice and assistance of all charities, large or small, in safeguarding the interests of all concerned. The regulations would be published, and they could be amended from time to time in the light of experience in order to meet the ever-changing needs of the community.

The debate on the second reading was adjourned.

Suggested Redrafting of Clause 3.

On Tuesday, Jan. 28th, the debate on the second reading of the Collecting Charities (Regulation) Bill was resumed.

Mr. **SHORT** (Under Secretary for the Home Office), replying to Sir **HERBERT SAMUEL**, said that the Home Secretary was fully conscious of the anxiety in regard to Clause 3 of the Bill, and realised that the measure ought to receive the general assent of the House as well as that of the great national and local charitable organisations. While he (Mr. Short) was not authorised to say that the clause would be withdrawn altogether, if the House would agree to the second reading when the Bill reached Committee the Government would redraft Clause 3 in such a manner as to cover the points which had been raised during the debate. Special consideration would be given to the interests of small domestic collections. The regulations would be drafted in broad general terms with a desire to safeguard the interests involved, and they would be laid on the Table of the House. If, when the Bill reached Committee and the regulations had been tabled, they could not get the general assent of the House, the Home Secretary realised that it would be futile to proceed with the Bill.

Mr. **WOMERSLEY** said that he had received a letter from a member of the Board of the British Hospitals Association stating that he was by no means satisfied with the Bill. He would like to know if the Under Secretary could assure him that he had received anything in the nature of assent to the Bill from that particularly influential body? In Grimsby every summer a particularly successful effort was made on behalf of the local hospital by means of a street carnival. A large number of collectors took part and they raised a good deal of money. During the week-end he had seen the Secretary of the Working Men's Committee responsible for this effort, and he had assured him that during the whole of the time that the collections had taken place they had never lost *one penny, although* thousands of pounds had been raised. If each of those collectors had to go to the police station to be registered the task of the Committee would be made absolutely impossible.

Mr. **SHORT** said that he did not think that the British Hospitals Association was a charitable organisation, but that it existed for the purpose of collecting statistics and so forth. He explained, however, that the Charity Organisation Society called together a large number of organisations—some 121 societies were represented, including a large number of hospitals—and some 216 members were present. The meeting passed a resolution unanimously in favour of the Bill as it was introduced into the House. He hoped that that statement would to some extent remove Mr. Womersley's anxieties. He repeated his promise to amend Clause 3 in order to satisfy the points raised in the debate and secure the general assent of the House to the Bill. With regard to collections, if they were house-to-house collections, under Clause 3 each collector would have to have a licence, but each collector would not have individually to apply for the licence. The licence would be applied for by the society for whom they were collecting.

The Bill was read a second time.

INDIANISATION OF INDIAN MEDICAL SERVICE.

On Jan. 22nd, replying to Major **GRAHAM POLE**, Mr. **WEDGWOOD BENN** (Secretary of State for India) stated that the progress of the Indianisation of the Indian Medical Service since 1924, the year in which the Report of the Lee Commission was published, was as follows: 1924, 150; 1925, 151; 1926, 161; 1927, 163; 1928, 165; 1929, 167. There were 127 Indians on Jan. 1st, 1928, holding temporary commissions in the Indian Medical Service who were not included in these figures.

MEDICAL EXAMINATION OF YOUNG PERSONS EMPLOYED AT SEA.

Miss **BONDFIELD** (Minister of Labour), replying to Sir **BASIL PETO**, said that the Draft Convention relating to the compulsory medical examination of children and young persons employed at sea, adopted by the International Labour Conference at Genoa in July, 1920, had been ratified by 21 countries, including Great Britain, Canada, and India.

CHILDREN (EMPLOYMENT ABROAD) BILL.

The Children (Employment Abroad) Bill was read a second time.

HOUSE OF LORDS.

THURSDAY, JAN. 23RD.

HOSPITALS AND ROAD ACCIDENTS.

The Road Traffic Bill was considered on report.

Requirements in Respect of Insurance Policies.

On Clause 35 Lord **LUKE** moved after subsection (1) to insert as a new subsection:—

> "Where any payment is made by an authorised insurer under a policy issued under this Part of this Act in respect of the death of or bodily injury to any person arising out of the use of a motor vehicle on a road and the person who has so died or been bodily injured has to the knowledge of the authorised insurer received treatment in a hospital in respect of the fatal or other bodily injury so arising, there shall also be paid by the authorised insurer to such hospital the expenses reasonably incurred by the hospital in affording such treatment to an amount not exceeding £25 for each person so treated."

He said that the people affected by this amendment were the great hospitals near trunk roads in which beds were filled with people injured in motor accidents to the exclusion of local patients for whom the hospitals were provided. In the great majority of cases no return of expenses had been made to the hospitals. This amendment was brought forward in Committee and met with such strong support from their lordships that it was only withdrawn on condition that it should be dealt with on report. In the interval they had been invited to visit the Ministry of Transport and they took with them an amendment which had been approved by the Voluntary Hospitals Committee of the King Edward's Hospital Fund. After consultations they thought that Earl Russell (in charge of the Bill) would be able to move the amendment, but they subsequently learned that he was unable to do so.

Viscount **KNUTSFORD** said that it would be a very great disappointment to the hospitals if the Government were not able to accept the amendment. Insurance companies had to fix their premiums to cover the cost of medical expenses, and it seemed unreasonable that because the expenses were incurred in a hospital that made no charge they should escape that part of the reasonable payment for the recovery of the patient. The hospitals did not want to make any legal charge against their patients, and they quite realised the legal difficulties, but they trusted Lord Russell to get over them.

A New Principle in Insurance.

Lord **PONSONBY** (Parliamentary Secretary to the Ministry of Transport,) said that the Government were sympathetic to the underlying principle of the amendment, and they only wished that it could be made practicable. They could not stretch this Bill, however, to comprehend too many subjects, and they could not make it a measure for paying back to the hospitals sums which they were being deprived of by the number of accidents brought to them. They felt that that was outside the scope of the Bill. It really involved an entirely new principle in insurance, and must necessarily increase the premiums. If, as stated by Lord Knutsford, the hospitals were reluctant to put forward any legal claim on a patient, how could the Government place the liability on the insurance companies in an Act of Parliament? To draft a clause to do that would be almost impossible, and to ask the Government to be responsible for this new principle was asking too much.

The Earl of **ONSLOW** appealed to their lordships to carry on with their intentions and see whether, even if the particular form of words were not approved, it would be possible on the third reading for something satisfactory to all sides to be introduced. Even if this were a new principle in insurance, was Parliament not always introducing new principles in legislation? This Bill was full of new principles.

The principle of this amendment was strongly recommended by the Voluntary Hospitals Commission in 1925. He would cite some interesting figures which showed the experience of the Royal Surrey County Hospital, of which he (Lord Onslow) was president. That hospital was situated near the Portsmouth road and was favourably—or perhaps he should say unfavourably—placed for the reception of road accident cases. The number in 1927 was 156; in 1928, 170; in 1929, 153. The average number of days in hospital of these road accident cases was 34; and there was a constant occupation during that time of 15 beds for these cases. As most of these were men, and they had only 70 beds for men, a very high proportion of the accommodation was taken up by this class of case. That being so, a very heavy expenditure was entailed on hospitals like theirs in this connexion. The hospitals made no complaint whatever of having to take these cases; it was their duty, but where compensation was paid it seemed not unfair that part of that compensation should go to the hospitals concerned.

Earl **Howe** said he hoped that the last word had not been said by the Government on this subject. If the strain on the hospitals became too great, and some of them had to put up their shutters, what would be the attitude of the Government then? The number of motor-cars in this country was not going to decrease, and there was not a word in this Bill as it stood that would increase public safety on the roads. Accidents, he thought, would tend to increase rather than to decrease in proportion.

Lord **Danesfort** said that unless the Government could assist the House in finding some practical solution of this urgent problem there would be deep and widespread disappointment and dissatisfaction throughout the country. The voluntary hospitals had done magnificent work for years. Their finances were greatly strained even before the advent of motor-cars; since the coming of motor-cars those finances had been more strained than ever. When under this Bill they were making provision for insuring third party risks they were really bound to do what they could to help the hospitals out of the great difficulties with which they were now faced.

Lord **Armstrong** said that, coming from the north, he would like to bear out what had been said about the experience of hospitals in the south. He was chairman of the Royal Victoria Infirmary, Newcastle, which had 550 beds. They had to reserve a ward of 30 beds entirely for motor accidents, and the cost to the infirmary they estimated at £5000 a year. He had read reports of several other hospitals in his area, and unless something could be done he felt that there would be great disappointment among the voluntary hospitals of the country.

Lord **Stanley of Alderley** said that the amendment did not involve a very exceptional or very wide extension of the insurance policy already provided for in the Bill. At present a man was liable for any accident which he caused. He was liable for the cost of medical attendance. If an injured person was taken to a private doctor or a private hospital or, he believed, to a poor-law infirmary, there could be no doubt that the insurance company would allow all the expense to which the person causing the accident was put in consequence of the accident. The only case—and that he understood from Lord Atkin was a doubtful one—where the liability might not exist was in the case of a voluntary hospital. Surely it was a very small extension of the principle which was admitted in the case of every other medical service to extend it to cover what was at least a moral and quite possibly a legal obligation upon a person causing an accident. To suggest that the amendment should be resisted because it would mean increasing the premiums which motorists had to pay was making a very large mountain out of a very small mole-hill. The cost of covering this extra liability would, he thought, be very small indeed.

The Earl of **Donoughmore** appealed most earnestly to the Government to accept the amendment now, even if they might have to alter the wording at a subsequent stage.

The Marquess of **Salisbury** said that unless the Government would announce their willingness to reconsider this matter before the third reading of the Bill he would be obliged to vote for the amendment.

Earl **Russell** said that the foundation of the case of those who had argued in favour of the amendment was not open to dispute. A perfectly serious and genuine effort had been made by the Government to draft a clause which would be free from fundamental objections, but frankly they had been unable to do so. This amendment meant that the insurance company was to have placed upon it a liability which was only a legal one in the sense that it was imposed by statute. It was no part of their original contractual liability to the insured person. That seemed to violate almost every principle of law. There was another aspect of the question which had struck him very strongly, and which he would ask those who were interested in hospitals to consider. Was it not rather difficult to go on talking about voluntary hospitals when they were compulsorily raising money by statutory obligation? It seemed that in their own interests hospitals were embarking on rather a slippery slope. They would be wise to be careful before they embarked on this point of view. If there was an increase in premiums which was directly due to this liability, and if it was in any way substantial, or if there was anything which caused a sense of grievance in the minds of motorists, it might very well be that voluntary subscriptions would fall off to a larger extent than these involuntary subscriptions would meet.

The amendment was agreed to without a division.

The consideration of Bill on report was adjourned.

HOUSE OF COMMONS.

WEDNESDAY, JAN. 22ND.

Slum Clearances.

Mr. **West Russell** asked the Minister of Health what programmes of slum clearance in the respective Tyneside local authority areas had been adopted and how many people in each case it was estimated would be rehoused.—Mr. **Greenwood** replied: Apart from schemes already approved, in regard to which I have given some information in reply to another question by the hon. Member, one scheme is now before me. It was submitted by the town council of Newcastle-upon-Tyne, and involves the rehousing of 945 persons.

Mr. **West Russell** asked the Minister of Health how many buildings had been acquired for demolition, how many buildings had been demolished, and new buildings erected in connexion with slum clearance schemes since April, 1925, in the Tyneside area; and how many persons formerly living under slum conditions had been rehoused under these schemes.—Mr. **Greenwood** replied: The information, so far as it is available, is given in the following return showing progress in connexion with slum clearance schemes in the Tyneside area from April 1st, 1925, to Jan. 1st, 1930:—

Local Authority.	Buildings which have been—		New dwellings erected.	Persons required to be re-housed under each scheme.
	Acquired for demolition.	Demolished.		
Wallsend T.C. ..	165	159	156	723
Gateshead T.C.	103	103	104	375
Tynemouth T.C.	42	42	66	347
Newcastle-upon-Tyne T.C.—				
Pilgrim-street	44	44	149	790
Prudhoe-street	58	58	124	656
Liverpool street.. ..	79	70	136	702
Sunderland—				
Flag-lane Area	4	2	100	878
Lawson's-court Area.	—	—	—	246
Total ..	495	478	835	4717

THURSDAY, JAN. 23RD.

Small-pox.

Mr. **Day** asked the Minister of Health whether he could give the number of cases of small-pox notified since Jan. 1st, 1929, in England and Wales, giving separate figures for London and the number of fatal results.—Mr. **Greenwood** replied: During the 52 weeks ended Dec. 28th, 1929, 9066 cases of small-pox were notified in England and Wales (excluding London), and 1903 cases in London. Among these cases 39 deaths occurred which were classified to small-pox. These figures are at present provisional.

Psittacosis in Warwickshire.

Captain **Eden** asked the Minister of Health whether his attention had been called to the recent outbreaks of psittacosis in Warwickshire; whether any inquiry into the causes of the disease was being instituted; and what steps he proposed to take.—Mr. **Greenwood** replied: The answer to the first part of the question is in the affirmative. All recent alleged cases of this disease in this country that have come to the notice of my department have been studied, and in some instances medical officers of the Ministry have taken part in the investigations. The question of further administrative action will be considered as soon as the inquiries now in progress are completed.

Captain **Eden**: Is it a fact that there is at present no obligation to report these cases once they have been diagnosed to the medical officer of health, and does the right hon.

gentleman not think in view of the seriousness of the disease that notification ought to be made compulsory?

Mr. **Greenwood**: That may be so, but I imagine in all these cases of relatively rare diseases that as soon as they occur they do in fact report them to medical officers of health.

Dr. **Vernon Davies**: Will the right hon. gentleman consider the possibility of inviting all port medical officers of health to pay particular attention to all parrots being brought into this country?

No answer was given.

Slum Clearance.

Major **Nathan** asked the Minister of Health when he anticipated that the Government's projected Bill as to slums would be passed into law; and whether meanwhile he was refusing to consider and approve housing schemes submitted by local authorities.—Mr. **Greenwood** replied: I regret that I cannot at present add anything to the statement made on Tuesday by the Prime Minister on the subject of the first part of this question. As regards the second part, no schemes for providing new houses are being delayed in my department by the expectation of the new Bill; but in the case of slum clearance schemes I have in some instances suggested that in view of certain difficulties which have arisen it would be better to await the proposals which I hope shortly to submit to this House.

Operative Experiments on Living Animals.

Mr. **Lovat-Fraser** asked the Home Secretary the number of operative experiments on living animals, witnessed by the inspectors under the Cruelty to Animals Act, 1876, during the years 1924–28, inclusive.—Mr. **Clynes** replied: The number of operative experiments witnessed by the inspectors during the years mentioned was 769.

Sale of Skimmed-milk Cheese.

Mr. A. M. **Samuel** asked the Minister of Health what steps his department was taking to prohibit the sale of skimmed-milk Dutch cheese without the buyer being made aware at the time of purchase that it was not whole-milk cheese.—Mr. **Greenwood** replied: The sale of skimmed-milk cheese under any description indicating that it is whole-milk cheese would be an offence under the Food and Drugs (Adulteration) Act. I have no power to impose any further requirements as to the sale of this commodity.

Silicosis and Workmen's Compensation.

Mr. **Hoffman** asked the Home Secretary if he had decided to extend the silicosis order under the Workmen's Compensation Acts; and, if so, when would it come into operation.—Mr. **Clynes** replied: If, as I assume, my hon. friend refers to the proposed inclusion of employment on the machines known as Slack's machines under the Metal Grinding (Silicosis) Scheme, I have not yet come to any final decision. As my hon. friend knows, a deputation on this question has been received from the representatives of the workers and certain representations on the subject have been received from the Sheffield Employers Association who asked for an interview. This has recently taken place and I have just received a report of the discussion. I will give the matter my immediate consideration, and will communicate with my hon. friend as soon as a decision is reached.

School Medical Services.

Dr. **Vernon Davies** asked the President of the Board of Education if he had made any estimate of the increased personnel and extra cost for the school medical services necessitated by the compulsory raising of the school age.—Sir **Charles Trevelyan** replied: Although some extension of the existing arrangements will be necessary, I am advised that the raising of the school age will not in itself involve any material increase in the personnel and cost of the school medical service.

Dr. **Davies**: Does that mean that the Board of Education intends to work the present medical staff more fully than they are being worked at present?

Sir C. **Trevelyan**: No. I said that there was no reason to suppose that it would involve any material increase in the personnel; that is to say, there will not be an additional school inspection, and therefore no increase of work will be required.

Nursery Schools.

Mr. **Thomas Griffiths** asked the President of the Board of Education how many new nursery schools had been approved in the period July to December, 1929, inclusive; what number were now under construction; and the average initial cost of building a new school.—Sir **Charles Trevelyan** replied: Proposals for nine new nursery schools were approved in the period July 1st to Dec. 31st, 1929. So far as my information goes, there are nine schools at present under construction. The average cost of providing a new nursery school, on the basis of a number of recent examples, is about £34 per place.

Emigrants and Health Insurance.

Sir **Godfrey Dalrymple-White** asked the Minister of Health what arrangements, if any, the Government proposed to make to enable a person insured under the Health Insurance Acts who wished to settle in our Dominions to obtain a transfer of the values standing to his credit with his approved society.—Mr. **Greenwood** replied: There is already statutory provision under which the payment of transfer values may be made in respect of insured persons who emigrate to the Dominions and become insured in a society in the Dominions, subject to corresponding rights being given in respect of insured persons who come from the Dominions to this country. Any claim for the payment of a transfer value under these conditions should be made by the society through whom the emigrant is insured in the Dominions.

Women Factory Inspectors in India.

Major **Graham Pole** asked the Secretary for India how many of the 39 regular whole-time and nine part-time additional factory inspectors in India were women.—Mr. **Wedgwood Benn** replied: One of the whole-time inspectors is a woman. All the part-time inspectors are men.

MONDAY, JAN. 27TH.

Opium Consumption in Calcutta.

Major **Graham Pole** asked the Secretary of State for India if he could give information showing the consumption of opium per 10,000 of the population in Calcutta and how this figure compared with the League of Nations' Health Committee's estimate of the limit of legitimate consumption per 10,000 of the population.—Mr. **Wedgwood Benn** replied: The consumption of opium per 10,000 of the population in Calcutta was 86 seers in 1928-29. The League standard, which was suggested for the medical and scientific requirements of countries possessing a highly organised medical system and has little applicability to the conditions of India, was equivalent to about 6 seers per 10,000.

Germany and Psittacosis.

Dr. **Vernon Davies** asked the Minister of Health if he was aware that, owing to the fact that four deaths had taken place in Germany recently from psittacosis, the authorities there had placed a ban upon the import of parrots into that country and if he would consider the advisability of taking similar action in this country.—Miss S. **Lawrence**, Parliamentary Secretary to the Ministry of Health, replied: My right hon. friend has seen newspaper reports to the effect that the action referred to has been taken in Germany, but he has no official information on the subject. As regards the second part of the question, my right hon. friend is not at present in a position to add anything to the answer given on Jan. 23rd.

Sale of Poisonous Disinfectants.

Lord **Fermoy** asked the Home Secretary if his attention had been called to the increasing sale of poisons in the form of disinfectants and to the fact that suicides from drinking disinfectants had increased from seven in 1918 to 287 in 1928; whether this was a matter now being considered by the inter-departmental committee on the Poison and Pharmacy Acts; when he expected the report of that body; and whether he proposed to schedule such disinfectants among the lists of poisons or to take any other action to limit the free sale of such products.—Mr. **Clynes** replied: My attention has not been called to the increasing sales referred to by the noble Lord. The Report of the Departmental Committee on the Poisons and Pharmacy Acts set up by the Lord President of the Council is expected shortly and will be laid before Parliament. Under the existing law I have no power to add to the schedule of poisons, such powers being vested in the Pharmaceutical Society, whose action has to be approved by the Privy Council.

TUESDAY, JAN. 28TH.

Venereal Disease in the Army.

Mr. Cecil **Wilson** asked the Secretary of State for War whether his attention had been called to the statements in the official Reports on the health of the Army concerning the provision of prophylactic outfits for self-disinfection after exposure, and, in particular, to the statement in the 1925 Health Report on this subject, which showed that out of 968 cases of venereal affection 181 men endeavoured to use the prophylactic outfit but used it incorrectly, that 207 men used it correctly but were infected, and that 580 men, although carefully instructed, did not use the prophylactic; and if, having regard to the youth of many of the personnel of the Army, the repugnance of many people to the State provision of such prophylactic packets, and their doubtful medical value, he would order that such provision be discontinued.—

Mr. T. SHAW replied: I am advised that the method of prevention of venereal disease by means of early disinfection has been shown to be generally efficacious and it has therefore been retained with a view to reducing venereal disease in the Army.

Health of British Troops in Egypt.

Mr. CADOGAN asked the Secretary of State for War whether he was in a position to state where the troops which were destined shortly to leave Alexandria and Cairo were to be quartered; and whether he would give a definite undertaking that the British garrison in these two towns would not be moved until a proper water-supply and adequate arrangements had been made for the health of the troops in their new quarters in the canal zone.—Mr. T. SHAW replied: No general settlement has yet been reached with the Egyptian Government. The answer to the first part of the question is consequently in the negative. As regards the second part, the hon. Member may rest assured that adequate arrangements will always be made for the health and comfort of the troops.

Noise and Public Health.

Mr. FREEMAN asked the Minister of Health whether he intended to introduce legislation dealing with excessive noise caused by faulty machinery, sirens, hooters, mechanical appliances, and other forms of noise inimical to public health.—Miss S. LAWRENCE replied: Other considerations than those of public health arise in regard to such legislation, and in any event the commitments of the Government would render its introduction impracticable.

Pulmonary Tuberculosis in the Navy.

Dr. VERNON DAVIES asked the First Lord of the Admiralty the number of men granted pensions for pulmonary tuberculosis held to be attributable to the conditions of service during each of the last 10 years for which statistics were available; the number of men refused pensions as being non-attributable; and the total number of men in receipt of such pensions at the latest convenient date.—Mr. ALEXANDER replied: The numbers of men invalided for pulmonary tuberculosis and awarded attributable pensions and the numbers refused such pensions for each year since 1924 are as follows:—

	Granted.	Not granted.
1924	5	151
1925	2	187
1926	6	191
1927	18	162
1928	42	98
1929	177	83

Statistics for the years prior to 1924 and the numbers of men now actually in receipt of attributable pensions for pulmonary tuberculosis are not available and could not be compiled without a very considerable expenditure of time and labour.

Venereal Disease in the Navy.

Mr. CECIL WILSON asked the First Lord of the Admiralty whether his attention had been drawn to the statements in the official reports on the health of the Navy, which showed that pocket antivenereal outfits, or prophylactic packets for self-disinfection, were provided for the use of all ranks in the Navy, and that definite and detailed instructions were given to the personnel as to the technique of self-disinfection at the time of exposure to venereal infection, and subsquently in the ablution chamber; and if it was proposed to continue these practices in the Navy, having regard to the youth of many of the personnel, the repugnance of many people to the State provision of such facilities, and the fact that the official statistics for the Army showed that many men who had used the prophylactic outfit according to instructions had been infected.—Mr. ALEXANDER replied: The Committee of Inquiry on Venereal Disease, over which Lord Trevethin presided in 1923, concluded that substantial results may reasonably be expected to follow from these prophylactic measures. The Committee did not think that there is any justification for putting obstacles in the way of individuals who desire to procure disinfectants as a measure of protection against venereal disease. It is therefore proposed to continue to provide such facilities for the voluntary use of naval personnel. No coercion is employed to induce men to make use of these facilities. On the other hand, every endeavour is made to warn them of the dangers of promiscuous sexual intercourse by means of lectures, and to inculcate a healthful morale by the provision of organised games, recreation and entertainments at all ports, at home and abroad.

MANCHESTER ROYAL INFIRMARY.—The Trustees invite applications for the Dickinson Research Travelling Scholarship in Medicine, of the value of £300, tenable for one year. Candidates must be University graduates who have taken out their full course of clinical instruction in the Infirmary and in the University of Manchester, and have earned distinction in so doing.

Medical News.

UNIVERSITY OF OXFORD.—On Jan. 23rd the degree of Bachelor of Medicine was conferred on G. Secker-Walker.

UNIVERSITY OF CAMBRIDGE.—On Jan. 24th the following degrees were conferred:—

M.D.—Samuel Levy-Simpson (enacted 1928).*
M.B. & B.Chir.—E. L. Graff, J. I. Sapwell, and T. K. S. Lyle.
B.Chir.—C. D. Politeyan.*

* By proxy.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates were successful:—

Surgery.—M. Asaad, St. Mary's Hosp.; L. P. Clarke, St. George's Hosp.; K. Graftdyk, Leeds; H. W. Maurer, Charing Cross Hosp.; M. Naylor, Sheffield; M. S. Rappoport, London Hosp.; Z. Risk, Birmingham; T. G. Robinson, Guy's Hosp.; and F. A. Yarde, St. Mary's Hosp.

Medicine.—R. F. M. Child, St. Mary's Hosp.; V. J. H. Coidan, Beyrouth and Paris; C. E. P. Davies and W. J D'Rosario, Guy's Hosp.; K. Graftdyk, Leeds; C. B. Jennings, Charing Cross Hosp.; A. Kellner, London Hosp.; C. Skinner, Guy's Hosp.; and P. Somasunder, London Hosp.

Forensic Medicine.—T. Chandrasekharen, Madras and Manchester; A. P. Edwards, Liverpool; E. A. Freywirth, Heidelberg; C. B. Jennings, Charing Cross Hosp.; E. Lethem, Guy's Hosp.; and P. Somasunder, London Hosp.

Midwifery.—H. C. Halge, St. Mary's Hosp.; E. Jacomb, Birmingham; E. Lethem, Guy's Hosp.; and M. S. Rappoport, London Hosp.

The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery: R. F. M. Child, C. E. P. Davies, W. J. D'Rosario. A. Kellner, H. W. Maurer, T. G. Robinson, and F. A. Yarde,

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At recent examinations the following candidates were successful:—

FINAL EXAMINATION FOR CONJOINT DIPLOMA.

W. B. Lee, Max Freed. D. P. Dow, Joseph Schwartz, Joseph Kinnear, O. V. Short, W. E. Faulkner, J. H. McGibbon, J. C. Coetzee, L. H. Abeyewardene, Margaret Leslie, T. G. Ward, E. O. Hagedorn, Florence L. M. Millard, H. S. Hamilton, George Henderson, R. F. L. V. Harvey, G. R. Parker, Pieter van der Lith, and Iskandar El-Aroussi.

The following passed in the undermentioned subjects:—

Medicine.—E. T. Buck, W. H. Taylor, G. L. Chadha, B. W. Advani, R. K. Pal, Kamil Kikhail, M. D. D. Jayawardana, Adam Paterson, and J. A. R. Lavoipierre.

Surgery.—B. W. Advani, Adam Paterson, J. A. R. Lavoipierre, N. Y. Labib, and Daniel Millar.

Midwifery.—H. O. Parkinson, W. H. Taylor, G. L. Chadha, S. J. B. Collins, T. Y. Bhide, R. T. A. Morrow, R. K. Pal, Kamil Mikhail, and M. K. Thiruvilangam.

Medical Jurisprudence and Public Health.—J. P. Walsh, E. R. Fothergill, C. M. Douglas, H. W. C. Robertson, T. F. Kirkpatrick, Loutfi Ahmed. A. W. Turnbull, J. T. M. Fenton-Fyffe, G. D. Morgan, G. L. Whitton, B. A. Armitage, and H. L. Lucas.

UNIVERSITY OF LONDON.—A course of six lectures on Cytology in Relation to Physiology and Pathology will be given by Mr. R. J. Ludford, D.Sc., at University College at 5 P.M. on Wednesdays, Feb. 5th, 12th, 19th, 26th, and March 5th and 12th.

GRESHAM LECTURES.—Four lectures on How England Learned to Control Disease will be delivered by Sir George Newman, at 6 p.m., on Feb. 4th, 5th, 6th and 7th, at Gresham College, Basinghall-street, London, E.C.

INNS OF COURT.—Among those called to the Bar on Jan. 27th was Dr. D. McI. Johnson, at Gray's Inn.

ROYAL LONDON OPHTHALMIC HOSPITAL.—The annual dinner of past and present students of this hospital will be held at the Langham Hotel, Portland-place, on Thursday, Feb. 13th, at 7 for 7.30 P.M., with Mr. J. Herbert Fisher, consulting surgeon to the hospital, in the chair. Tickets may be had from Mr. Rupert Scott, 70, Harley-street, W.

PREVENTION OF DEATH IN CHILDBIRTH.—In accordance with the will of the late Dr. Robert Thomas Nichols, the Royal Society of Medicine offers every three years a prize (being the accumulated interest on £2,200) open to any British subject, for a contribution towards the Discovery of the Causes and the Prevention of Death in Childbirth from Septicæmia. Work submitted for the third award must reach the Secretary of the Society (1, Wimpole-street, London, W.1) not later than Oct. 1st. Work published since Oct. 1st, 1927, may be submitted.

UNIVERSITY OF GLASGOW.—The Harry Stewart Hutchison Prize, of the value of about £50, for the best writing or writings embodying Original Research Work in a Branch of Medical Science relating to Children will be awarded in 1931. Medical graduates (of not more than ten years' standing from their first graduation in medicine) of all British, Home, and Colonial Universities may be competitors. Compositions must be submitted, in proper form, to the Clerk of Senate, not later than March 31st, 1931.

MINERS' GIFT FOR TREATMENT OF CANCER.—From the Notts Miners' Welfare Fund a contribution of £3500 has been given in the campaign in Nottinghamshire against cancer, expressly for the purchase of a quarter of a gramme of radium and the necessary appliances to enable the Council in charge to afford priority of treatment to miners and their dependants who may be certified for radium treatment.

LEAD POISONING IN LANCASHIRE.—Dr. W. E. Cooke, pathologist under the Lancashire Insurance Committee's scheme for providing free laboratory diagnosis services for insured persons, states in a report that during the past few months several cases of lead poisoning in the county of Lancashire have come under notice. The common factor in all cases is the habit of drinking from the hot-water service in the home.

THE German Society of Internal Medicine is to hold its forty-second meeting from April 7th–10th at Wiesbaden under the presidency of Prof. Volhard of Frankfurt a.M. The principal subjects put down for discussion are the Pituitary, to be introduced by Trendelenburg (Berlin) and Lichtwitz (Altona); and Focal Infection, to be introduced by Rosenow (Rochester) and Bieling (Frankfurt a.M.). Those who wish to take part are asked to communicate with Prof. Volhard at the Medical Clinic. Following this gathering is a meeting of the German Society of Pædiatrics from April 11th to 14th. Any questions relating to the exhibition, which will be held in common, should be directed to Herr Bürger, Städtische Kurverwaltung, Wiesbaden.

BRITISH COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS.—At a Council meeting held in London on Jan. 21st it was reported by the honorary secretary that a large number of names had been received from the Dominions in regard to the election of Foundation Fellows and Members of the College.—Memoranda concerning the use of anæsthetics in labour and also maternal mortality, drafted at the request of the Ministry of Health, were submitted to the Council by a special committee elected for the purpose and were passed by the Council.—It was agreed that the election of the Council by popular vote should take place in May as foreshadowed at the annual meeting held in December last.

DONATIONS AND BEQUESTS.—Lieut.-Colonel W. B. Brocklehurst, of Prestbury, near Macclesfield, left, among other bequests, £1000 to the Macclesfield General Infirmary Endowment Fund.—Mr. Arthur Jowett, of Windy Bank, Batley, Yorkshire, left £1000 to the Batley and District Hospital for the purpose of endowing a bed to be known as the "Arthur, Mary, and Carrie Jowett" bed; and £1000 similarly to the Dewsbury Infirmary.—Mrs. Mary Elizabeth Christie-Miller left £1000 to the Queen Charlotte Lying-in Hospital.—The Royal Manchester Children's Hospital has received £1000 from the executors of the late Mr. Christopher Higginbottom, and £1000 from the executors of the late Mr. Joseph Hugh Monk.—Mr. William Bell, of Wallasey, left £2000 to his niece, Katherine Jane Guthrie "to be used as she may think fit for medical research" and £100 to Victoria Central Hospital, Wallasey.

NATIONAL MARK MALT EXTRACT.—The following statement has been circulated from the Ministry of Agriculture: "With the coöperation of the Retail Pharmaceutists' Union, the Ministry of Agriculture and Fisheries has issued to over 7500 retail pharmaceutists in England and Wales a letter, inviting their coöperation in placing upon the market National Mark malt extract (with oil) which is now being produced by a large number of malt extract manufacturers in this country. The malt extract is made entirely from home-grown barley to very high pharmaceutical standards designed to ensure the maximum nutritive and medicinal value for the product. National Mark malt extract and oil has been available since Jan. 8th last, and already very encouraging reports have reached the Ministry of its reception by the pharmaceutical trade. The National Mark Malt Extract Scheme is of great benefit to the public in establishing guaranteed high standards for a food and medicine which is in universal demand. In order to be sure that they are obtaining the genuine article, all purchasers of National Mark pharmaceutical malt extract and oil should look for the dark blue ribbon and seal with a National Mark which is placed upon all genuine supplies."

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Feb. 4th.—5.30 P.M., ORTHOPÆDICS. (Cases at 4.30 P.M.) 8 P.M., PATHOLOGY. Meeting at the London School of Hygiene and Tropical Medicine, Keppel-street, W.C. Communications: Dr. J. G. Thomson: The Cultivation of *Herpetomonas culicidarum*. Dr. P. A. Buxton: A Case of Extensive Destruction of Bone Resulting from a Chronic Ulcer of the Leg in a South Pacific Islander. Dr. Ordmann: Pneumococcal Infections in Johannesburg. Mr. R. Lovell: A Bacillus of the Salmonella Group Causing Abortion in Ewes. Demonstrations: Dr. J. T. Duncan: Specimens Illustrating Mycetoma and Blastomycosis. Dr. G. S. Wilson: Apparatus for the Continuous Passage of Gaseous Mixtures through Cultures of Bacteria in a Liquid Medium. Dr. G. S. Wilson: Apparatus for the Growth of *Br. abortus* in Atmospheres Containing CO_2.

WEDNESDAY.—5 P.M., HISTORY OF MEDICINE. Paper: Mr. F. Prescott: Spallanzani on Spontaneous Generation and Digestion. 8.30 P.M., SURGERY. Discussion on Intrathoracic Tumours. Openers: Mr. Tudor Edwards and Mr. W. H. C. Romanis. Followed by Dr. L. S. T. Burrell and Dr. F. G. Chandler.

THURSDAY.—8 P.M., TROPICAL DISEASES. Papers: Dr. M. F. Sorour: Bilharzial Lesions of Blood-vessels. (Illustrated by lantern slides.) Dr. J. Gordon Thomson: Notes on a Visit to the Antimalarial Work in Italy. (Illustrated by lantern slides.)

FRIDAY.—10.30 A.M., OTOLOGY. (Cases at 9.30 A.M.) Discussion on Brain Abscess. Papers by Prof. Neumann (Vienna), Mr. E. Miles Atkinson, and Mr. H. W. B. Cairns. Cases will be shown by Sir James Dundas-Grant and Mr. C. Hamblen Thomas. 5 P.M., LARYNGOLOGY. (Cases at 4 P.M.) Cases will be shown by Dr. Dan McKenzie, Mr. O. Popper, Miss McLeod, Mr. V. E. Negus, Mr. E. Watson-Williams, Mr. M. Vlasto, and others. 8.30 P.M., ANÆSTHETICS. Discussion on Anæsthesia in Thoracic Surgery. Openers: Mr. C Langton Hewer and Mr. I. W. Magill. SURGERY. Members of the Section of Surgery are specially invited to be present.

ROYAL INSTITUTION, 21, Albemarle-street, W.

FRIDAY, Feb. 7th.—9 P.M., Dr. Leonard Hill: Diving.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.

TUESDAY, Feb. 4th.—2.30 P.M., Quarterly General Meeting at David Lewis Colony, Warford, Cheshire. Dr. Alan McDougall: The Why of Conduct. Dr. Richard Handley: Pineal Cysts. Major D. E. Dhunjibhoy: Types of Insanity in India.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn, W.C. (Hunterian Lectures).

MONDAY, Feb. 3rd.—5 P.M., Prof. Geoffrey Keynes: Radium Treatment of Carcinoma of the Breast.

WEDNESDAY.—5 P.M., Prof. J. Herbert Fisher: Perforating Injuries of the Eyeball.

FRIDAY.—5 P.M., Sir John Rose Bradford: Massive Collapse of the Lung.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Feb. 3rd, to SATURDAY, Feb. 8th—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Tues., 4 P.M., Lecture by Prof. Hugh MacLean: The Present Position of Gastric Physiology and its Bearing on Gastric Diseases. No fee.—ST. MARK'S HOSPITAL, City-road, E.C. Thurs., 5 P.M., Clinical demonstrations by Mr. E. T. C. Milligan. No fee.—BROMPTON HOSPITAL, S.W. Sat., 3 P.M. (in the theatre), Dr. Batty Shaw will demonstrate on Allergic Pneumonia. No fee.—BETHLEM ROYAL HOSPITAL, S.E. Special course in Psychological Medicine. Tues. and Sat., lecture-demonstrations at 11 A.M.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Feb. 3rd.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases. Clinics. Operations.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.

WEDNESDAY, Feb. 5th.—4 P.M. (at St. James's Hospital, Ouseley-road, Balham, S.W.), Dr. Ronald G. Canti: Demonstration of the Cinematograph Film on the Biological Aspect of Radium.

UNIVERSITY COLLEGE, Gower-street, W.C.

Monday, Feb. 3rd.—5 P.M., Prof. A. V. Hill: Oxygen and the Recovery Process in Muscle and Nerve. (Third of four public lectures.)

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark Hill, S.E.

Thursday, Feb. 6th.—9 P.M., Mr. J. M. Bickerton: Diseases of the Eye in General Practice.

ROYAL NORTHERN HOSPITAL, Holloway.

Tuesday, Feb. 4th.—3.15 P.M., Mr. F. D. Saner: Colonic Ptosis and Its Results.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

Tuesday, Feb. 4th.—5 P.M., Dr. S. E. Dore: Affections of the Hair and Hair Follicles.

Thursday.—5 P.M., Dr. A. M. H. Gray: Xanthoma. Herpes.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

Monday, Feb. 3rd.—1.30 P.M., The Ear: Examination and Diagnosis.

Wednesday.—1.30 P.M., The Nose: Examination and Diagnosis.

ST. MARY'S HOSPITALS, Manchester.

Friday, Feb. 7th.—4.30 P.M., Post-graduate Lecture (at the Whitworth-street West Branch), Dr. C. P. Brentnall: Abortion.

SHEFFIELD POST-GRADUATE LECTURES ON CANCER.

Tuesday, Feb. 4th.—8.45 P.M. (in the Physics Lecture Room of the University of Sheffield), Sir Lenthal Cheatle: The Treatment of Mammary Carcinoma by Radiation.

SHEFFIELD POST-GRADUATE CLINIC.

Friday, Feb. 7th.—3.30 P.M. (at the Royal Infirmary), Dr. Barnes: Clinical Forms of Nephritis.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

Wednesday, Feb. 5th.—4.15 P.M. (at the Royal Hospital for Sick Children), Mr. A. MacLennan: Surgical Cases.

Appointments.

Nisbet, B. R., M.D., Ch.B. Edin., D.P.H., has been appointed Medical Officer of Health for Kilmarnock.

Certifying surgeons under the Factory and Workshop Acts: Broster, E. D., L.R.C.P. Lond., M.R.C.S. (Wirksworth), Fisher, A. R., L.R.C.P. Lond., M.R.C.S. (Dover); and Manning, H. P. O., L.R.C.P. Lond., M.R.C.S. (Faversham).

Vacancies.

For further information refer to the advertisement columns.

Accrington, Victoria Hospital.—H.S. £150.

Birmingham City and University, Joint Board of Research for Mental Disease.—Histological Asst. £4 weekly.

Birmingham General Hospital.—Res. Surg. Reg. £120–£140.

Birmingham, Queen's Hospital.—Third Phys. to Out-patients and Third Surg. to Out-patients. Each £50.

Bootle Borough Hospital, Derby-road.—Sen. Res. M.O. Also Two Jun. H.S.'s At rate of £200 and £125 respectively.

Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £150.

Bristol Eye Hospital.—H.S. £150.

Bristol Royal Infirmary.—H.P.'s and H.S.'s, &c. Each at rate of £60. Cas. H.S. and Dental H.S. Each at rate of £80.

Buxton, Devonshire Hospital.—Asst. H.P. At rate of £150.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Out-patient Statistical Registrar. First Asst. to Out-patients. Also Res. H.S. At rate of £75.

Chelmsford, County Council of Essex and U.D.C. of Chingford.—Asst. County M.O.H., &c. £800.

Chelsea Health Soc. and School for Mothers.—M.O.

Chester Royal Infirmary.—H.S. £150.

Croydon County Borough.—Asst. M.O., &c. £600.

Derby, Bretby Hall Orthopædic Hospital.—Asst. M.O. At rate of £150.

Derby, Derbyshire Hospital for Sick Children.—Res. M.O. At rate of £150.

Derby, Derbyshire Royal Infirmary.—Ophth. H.S. H.S. Also Asst. H.S. Each £150.

Doncaster Royal Infirmary.—Second H.S. £150.

Ealing, Borough of.—Asst. M.O.H. £600.

Eastbourne, Princess Alice Memorial Hospital.—Sen. H.S. At rate of £125.

Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.

Exeter, Royal Devon and Exeter Hospital.—H.P. At rate of £150.

Huddersfield Royal Infirmary.—H.S. At rate of £150.

Hull Royal Infirmary.—Cas. H.S. At rate of £130.

Ilford, King George Hospital.—Second H.S. At rate of £100.

Indian State Railways.—Dist. M.O. Rs. 650 per mensem.

Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £150.

King's Lynn, West Norfolk and King's Lynn Hospital.—Hon. Physician.

Leeds, Tuberculosis Sanatorium, Killingbeck.—Asst. Res. M.O. £250.

Liverpool, David Lewis Northern Hospital, Clinical School.—Med. Tutor and Registrar. £175.

Liverpool, Royal Liverpool Children's Hospital, Myrtle-street.—Res. Cas. O. £250.

London Jewish Hospital, Stepney Green, E. Cas. O. At rate of £150.

London School of Hygiene and Tropical Medicine.—Demonstrator in Division of Bacteriology and Immunology. £400.

London Temperance Hospital, Hampstead-road, N.W.—Cas. O. At rate of £120.

Macclesfield General Infirmary.—2nd H.S. At rate of £150.

Manchester, Ancoats Hospital.—Res. M.O. £150. Also Orthopædic H.S. Also H.S. Each at rate of £100.

Manchester, Park Hospital, Davyhulme.—Jun. Res. M.O. At rate of £200.

Manchester Royal Infirmary.—Dickinson Scholarships, Research Travelling Scholarship in Medicine. £300. Also Pathology Scholarship. £75.

Miller General Hospital, Greenwich-road, S.E.—Res. M.O., Cas. O., and H.P. At rate of £250, £150, and £125 respectively.

National Hospital, Queen-square, W.C.—Hon. Dental Surgeon.

Newcastle-on-Tyne, Wooley Sanatorium, near Hexham.—Asst. M.O. £350.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Six Jun. Surg. Regs. Each £150.

Northern Rhodesia, Roan Antelope Copper Mines, Ltd.—Jun. M.O. £900–£1000.

Norwich, Norfolk and Norwich Hospital.—Hon. Surg. Also H.S. £120.

North Middlesex Hospital, Edmonton, N.—Second Radiographer. £250.

Nottingham Hospital for Women.—H.S. At rate of £150.

Oxford City.—Deputy M.O.H. £600.

Plymouth, South Devon and East Cornwall Hospital.—Hon. Asst. Surg. for Obstet. and Gynæcological Depts.

Royal Northern Hospital, Holloway, N.—H.S., Res. Out-Patient Cas. O. and Anaesthetist. Each at rate of £70.

St. Bartholomew's Hospital, E.C.—Clin. Asst. to Venereal Dept. One Guinea per session.

Salford Royal Hospital.—H.S. At rate of £125.

Sheffield Royal Hospital.—Ophth. H.S. Also Res. Anæsthetist. Each at rate of £80.

Sheffield Union Hospital.—Res. Asst. M.O. £250.

Stirling District Mental Hospital, Larbert.—Jun. Asst. M.O. £300.

Stoke-on-Trent City Education Committee.—Asst. School M.O. £500.

Stroud General Hospital, Glos.—H.S. At rate of £150.

Taunton and Somerset Hospital.—Jun. House M.O. At rate of £100.

Walsall County Borough.—Asst. M.O. £600.

Warrington Infirmary and Dispensary.—Jun. H.S. £175.

Westminster Hospital, Broad Sanctuary, S.W.—Asst. Surg. Reg. At rate of £50. Also Orthopædic Surgeon.

Windsor, King Edward VII Hospital.—H.S. At rate of £100.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at East Linton (E. Lothian).

Births, Marriages, and Deaths.

BIRTHS.

Dendy.—On Jan. 19th, at Glyn Eithin, Mumbles, the wife of Dr. E. H. Dendy, of a daughter.

Halliwell.—On Jan. 21st, at Welbeck-street, W., the wife of Arthur C. Halliwell, F.R.C.S., of a son.

Miall-Smith.—On Jan. 22nd, to Dr. Gladys Miall-Smith, of Welwyn Garden City, the wife of Dr. H. J. B. Fry—a daughter.

Petit.—On Jan. 22nd, at a nursing home, New Malden, the wife of Dr. Petit, "Dunurlin," New Malden, of a son.

Warburton.—On Jan. 22nd, at Cotley, Streatham Hall, Exeter, the wife of P. D. Warburton, M.R.C.S., D.P.H., of a son.

Whitman.—On Jan. 24th, at Stoneboro' Cardiff, the wife of Dr. V. E. Whitman, Gold Coast Medical Service, of a daughter.

MARRIAGES.

Purnell—Goldsmid.—On Jan. 25th, at the Parish Church of St. Nicholas, Chiswich, Purnell Purnell, M.R.C.S., L.R.C.P., of Leigham Court-road, Streatham, to Ivy Florence, only daughter of George Campbell Goldsmid, of Bedford Park, Chiswick.

DEATHS.

Bell.—On Jan. 22nd, John Henderson Bell, M.D., of 3, Carlyle-square, London, S.W.3.

Boobbyer.—On Jan. 21st, suddenly, at Wellington-square, Nottingham, Philip Boobbyer, M.D., in his 73rd year.

Eidinow.—On Jan. 23rd, suddenly, at Ferncroft-avenue, Hampstead, N.W., William Eidinow, M.R.C.S. Eng., L.R.C.P. Lond., late of Colebrook-road, Islington, N.

Jones.—On Jan. 24th, at Aviemore, Hanwell, and of Cravenhill, W., Henry Cadwaladr Jones, L.D.S. R.C.S. Eng., aged 56.

Riddell.—On Jan. 24th, at his residence, Westfields, Sandbach, Dr. Robert Riddell, aged 61 years.

Wallace.—On Jan. 22nd, at his residence, Wallacefield, Belle Vue-road, Paignton, Dr. Abraham Wallace, aged 80 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE HISTOLOGICAL BASIS OF HEALTH.*

II. CELL-DIFFERENTIATION; THE NERVOUS SYSTEM IN RELATION TO HEALTH.

BY PROF. J. BOEKE,
DIRECTOR OF THE LABORATORY OF EMBRYOLOGY AND HISTOLOGY OF THE UNIVERSITY OF UTRECHT, HOLLAND.

As soon as we begin to discuss the problems of development and growth and their bearing on the problem of health, we must concentrate our thoughts on the wonderful phenomenon of the gradual differentiation of the cellular units. Growth may be represented by a mathematical formula, and identified as a chemical process. The formula of Robertson may be used as well for cellular growth as for the relation of the different organs to the body in growth, as long as we take into account only that part of the process which we may safely compare with the physico-chemical processes in nature, and try to trace the broad outlines of the chemical changes underlying growth. But as soon as we speak of the differentiation of the tissues, which leads us to an ever-increasing and ever more complicated inter-relation of the parts of the body to the body as a whole, and a much more complex relation of the organism to the outside world, we have approached one of the fundamental problems of existence. The endowments which bring us into relation with the external world make our internal life so complex that we feel that no mathematical formula will ever describe these relations. We touch the fundamental mysteries of existence; we are hovering on the outskirts of our human conceptions, and we shall never press beyond them, even when perhaps in time the limit to which we are able to go may be moved a little farther back, and some of the things which are at present utterly mysterious and incomprehensible will be comprehended and explained so that we may express them by a formula.

Differentiation—the Secret.

In differentiation lies the secret of life, of death, of health, for it is the most intrinsic factor of the organism. Without differentiation no life is possible, but death is the price. In 1911 Carrel, the well-known experimentalist, took a small piece of tissue from the living developing egg of a fowl, put it under a cover-glass in a drop of sterile nutritive fluid and kept it there at a temperature of 38° C. It remained alive and continued to grow and every day a small piece of the living culture was cut off and put into a fresh drop of the nutritive fluid. These pieces of living tissue continued to grow, and a number of them are still growing after 18 years. If all the living tissue produced by the growth of this small original piece of embryonic tissue had remained alive and growing at the same rate as the few pieces left to survive, a quantity of living material would have been produced many times as large as the terrestrial globe. Thus a piece of embryonic tissue continues to grow and has now been growing for a longer period than the life-duration of the fowl from which the original piece was taken. But it does not differentiate; it simply grows and multiplies and is practically immortal. If the piece of tissue had remained in the embryo, it would in the course of a few weeks have developed into a chicken—viz., into an organism of a distinct, harmonious, and differentiated form. But with the inauguration of this differentiated form death has come into action. Even in its sheltered environment the duration of life of the common domestic fowl is not more than six to nine years.[1] The same thing is seen in cultures of different cell-types outside the organism. In the ordinary plasma and fluid media the general character of the outgrowth of different cell-types taken from the living organism varies with, and is more or less characteristic for, each cell-type. Lewis assures us that it is now possible in most instances to identify the outgrowth—i.e., the specific cell-type involved, by the patterns formed by the cells in their relation to one another. Nevertheless, as a rule, differentiated cells lose their peculiar character, and grow out as common elongated branched cells without a distinct differentiation. They never form differentiated organs or functional units as in the body.

Differentiation, therefore, is the leading feature of the organism. Development is nothing but differentiation; we may define it as physiological division of labour and as morphological division of substance, but these are merely two aspects of the same thing, and in life they are actually inseparable. The synthetic cause of differentiation is, of course, the organism itself, but in the last analysis all differentiations are probably the results of chemical changes in the protoplasm and in the metaplasmic substances. So we may conclude that, in general, differentiation and diversity of cells originate in a diversity of relationships between nucleus and protoplasm. The relation between the size of the nucleus and the amount of protoplasm in differentiated cells and in functional units is nearly always quite different from that in undifferentiated cells. This change in the nucleo-protoplasmic relation alters the assimilative powers of the protoplasm and the autocatalyst level, so that the regenerative power of the tissues of any given species diminishes with their differentiation. The more highly differentiated the tissue, the less is the variety of tissues to which it can give rise when injury calls forth repair. In general, the potential morphological complexity of a cell stands in inverse relation to its degree of physiological differentiation (Robertson). Morphological differentiation may be the consequence of preceding physiological differentiation, followed by the assumption of specialised function, and this implies the performance of more and more limited functions, and so the exercise of more limited morphological potentialities.

But these are only generalities, and in the end do not give us any clear insight into the relation of differentiation to the problem of health. Even the remarkable relation between the nuclear ratio in the cells and the occurrence and frequency of cell division, important as it is in itself, does not throw much light on the problem. Of the highest importance, however, is the influence which a number of substances in the body, especially hormones, exert on the differentiation of the tissues. Normal differentiation during development is the result of hormonic influences; in mammals the maternal hormones may pass into the developing embryo and alter its differentiations, and the sex-hormones of the male embryo of a pair of twins in cattle may pass into the body of the female embryo and alter its secondary sexual characters (free-martins). Even the histological type of the epithelia of the adult body may be changed by hormones introduced into the body; a diet characterised by the absence of vitamin A may cause the epithelia of different mucous membranes to become stratified. Embryonic tissues may form hormones which cause other embryonic tissues coming into contact with them to differentiate in a certain way. The important feature of this process of induction seems to me to be that the differentiation induced is a differentiation other than that of the cells producing the hormones themselves. The hormone produced by a certain cell does not influence the cell itself in its differentiation, but may cause other cells, apparently as highly specialised as the cell itself, to alter their developmental course of differentiation and form another organ or functional unit.

We may safely say that everywhere in the processes of differentiation hormones play a most important part and, indeed, even the characteristics of the human race have been put down to the action of the different hormones produced by the endocrine organs. These hormones may actually enter into the composition of the protoplasm of the cells which they affect, and so become an essential constituent of the living substance. But even if we can trace a certain differentiation down to the action of a distinct hormone, the character of the differentiation itself is not in the least explained, nor is there an answer to the question why and how during development and growth the different hormones and other substances, by which those processes seemingly are regulated, are formed just where and when they are needed, so that the harmonious form of the organism is developed and remains harmonious during growth.

The same thing may be said of malign tumours. It seems very probable nowadays that these tumours arise as the result of stimuli which cause an abnormal proliferation of cells, with all its mediate and immediate effects. Thus the application of soot or tar to the skin may induce cancer of the skin in mice and, as Bonne showed, in monkeys, and indeed in man, and a number of substances of various kinds may induce this hyper-differentiation and cell proliferation. Among these are different hormones and substances (as the "auxetics" of Ross in tar) which cause inflammatory reactions and abnormal cell proliferation, while such other substances as tethelin cause retardation of the growth of the cancer cells. We could, therefore, try to bring the problem of cancer growth down to that of the nuclear ratio and the autocatalyst level, and so to the general problem of growth, and to an acceleration of senescence of the hyper-differentiated cancer cells. But the cancer problem is so extensive and difficult that I must confine myself here to these generalities, for every detail of the problem would require a lecture in itself to make it clear and to discuss it.

The Histological Basis of Health in the Nervous System.

At first sight no other element of the human body shows so many contradictions, when looked at from this point of view, as the nervous system. Nervous tissue, according to Child, has an exceptionally high metabolic rate and, as is well known, is extremely sensitive to lack of oxygen. On the other hand, even in inanition the nervous tissue resists destructive forces longer than any other. The cells of the nervous tissue possess a very high nuclear ratio, not only in development but also in the adult stage. And yet, after they are formed, the nerve-cells as a rule do not proliferate any more; they remain unaltered as long as the body itself lives, whereas most of the body cells have a far shorter life duration than the body as a whole. So the nerve-cells are permanent, and yet no cells show so markedly the effects of old age. Indeed, by a number of authors senescence and physiological death is attributed chiefly to the breakdown of the nervous tissue, death through old age being a cerebral phenomenon due to alterations of the nerve-cells. On the other hand, longevity, as exhibited by man and different species of animals, is, according to Friedenthal, in close correspondence with the "cephalisation-factor"; that is, with a high degree of development of the nervous system and of the ratio of the weight of the brain to the weight of the body. Seen from a morphological standpoint, the nerve-cells are among the least differentiated of animal cells; seen from a physiological standpoint, they are the highest differentiated cells of the animal body, and their function is the most finely adjusted and equilibrated function of the organism. Once formed, they show a marked tendency to remain unaltered during the lifetime of the organism, and yet in tissue cultures of embryonic tissues the nerve-cells are almost the only ones to show a distinct differentiation. As Lawrentjew showed quite recently, a nerve-cell in tissue culture may show a real innervation of a mesoblast cell by an outgrowth which penetrates into the mesoblast cell and forms an end-organ in the protoplasm. Nervous tissue is the only tissue which shows strongly marked regenerative powers in mammals, even in adult animals. The nerve-cells are extremely sensitive to lack of oxygen, yet only exceptionally do we see blood-vessels in close connexion with nervous elements, the capillaries as a rule remaining at some distance from the nerve-cells while the large arteries do not even enter the central nervous system. Nerve-cells, as far as we can judge, keep their form unaltered from youth to old age, and yet the functions of what we call our memory require a constant changing of the finer structure of the cells and their connexions as long as we are capable of learning something new. In short, we seem to see contradictions everywhere; every problem we have discussed takes on quite a different aspect when applied to the study of the nervous system.

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* Being the second of two lectures (illustrated by lantern slides) delivered in London under the Chadwick Trust (slightly abridged).

[1] A case is reported of a cock surviving for 20 years.

Can we apply to the nervous system the idea of harmony between the elements constituting the body? As early as 1877 G. H. Lewes, in his book on the Physical Basis of Mind, conceived the idea of a struggle for life between the various cells constituting the organism and a consequent physiological selection of the fittest elements. Roux afterwards took up this conception and utilised it to interpret the differentiation of the nervous system. At first sight we are sorely tempted to say that Lewes was right, and that especially in the nervous system this struggle for life is raging from the beginning to the end of life, and that by this struggle the entire function of the system is regulated, although, of course, not in the sense of the original conception of Lewes 60 years ago.

The tissue in the central nervous system is differentiated into two kinds of cellular elements: (*a*) the ganglion cells, the true nervous elements, with their cell processes—the branched dendrites—conducting the stimuli towards the cell body, and the neurite or axon conducting it to other nerve-cells or to the peripheral nerves (which are nothing else but bundles of these neurites); and (*b*) the neuroglia cells, supporting elements, not used in the processes of transmission of nervous stimuli but of the highest importance for nutrition. The ganglion cells are often in very close connexion with neuroglia cells, which enclose the ganglion cell as a capsule and thus separate it from the surrounding tissue which carries the nutritive blood-vessels. So the ganglion cell is dependent on these capsule cells for its nutrition and oxygen-supply, and there is established a very intimate and harmonious connexion between them; the neuroglia cells, as Holmgren showed, often sending into the ganglion cells processes by which nutritive agents may be introduced into the protoplasm of the ganglion cells and dissimilation products expelled.

When old age sets in, there often seems to spring up between the two kinds of elements a disharmony, a struggle, in which the ganglion cell loses ground and shrivels, while the capsule cells multiply, push into the cell body of the ganglion cell and eat it up, until the shrunken ganglion cell is nearly filled with capsule cells, and in the end perishes and disappears. This contest occurs both in apparent health and in certain diseases. This process of *neuronophagy*, or the eating up of the ganglion cells, is one of the most interesting phenomena of the incipient senescence of the nervous system, and one of the most suggestive phenomena of the alterations which help to bring the life of the organism to a close.

Harmony in the Nervous System.

Neuronophagy is not in reality a struggle for mastery between the nervous elements and their supporting cells; it is simply a supreme effort to keep up the harmony, which is in danger of being broken by the diminishing vitality of the ganglion cells as the result of the incipient dissolution of old age. This wonderful harmony of function between the neuroglia elements and the nerve-cells is seen everywhere in the nervous system. One of the contradictory phenomena of the central nervous system is that the ganglion cells, which have a high metabolic rate and are extremely susceptible to lack of oxygen, are, as a rule, not surrounded by blood-vessels like, for example, the muscular elements, but the blood-vessels nearly always lie at some distance. Here the nutritive function of the neuroglia cells is shown in the most striking way. We often find an arborescent glial cell which is attached very firmly to the wall of a blood-vessel by one of its cell processes; with its cell body it is applied as closely as possible to a ganglion cell, covering it as far as possible by its branching cell processes. We can only interpret these extremely suggestive pictures by supposing that substances are passing from the blood-vessels through the protoplasm of the glial cell to the protoplasm of the ganglion cell and vice versa, just as in the case of the capsule cells.

Properly to exercise the nervous function—the conducting and transformation of nervous stimuli—the ganglion cell must not only be supplied with abundant nourishment and oxygen, but the conducting cell processes, the neurites, must also be sheltered and isolated from injurious influences, chiefly chemical, in the surrounding elements. Here, too, the glial cells are of the highest importance. They encircle the axons and form isolating substances of a lipoid character —the myelin—which enwrap the neurites. During the development of the nervous system the glial cells grow out from the central nervous tube and form a syncytial arrangement with the outgrowing nerve-cell processes themselves, following them to the end-organs, and in this syncytium they form the same isolating substances in order to keep the nerve-fibres free from injury and able to fulfil their function properly. When the more important parts of the nervous system come into function (after birth) the glial cells show such a marked acceleration of chemical activity that many of them are filled up entirely with the products of these chemical dissociations, loosen themselves out of the continuity of the glial system, and are found as "granule cells," lying free between the other elements of the nervous tissue. That in pathological cases these cells become more abundant and form a typical feature of irritated parts of the brain is no argument against the view that all these phenomena are to be explained as so many efforts to preserve the harmony and equilibrium between the functional and the nutritious elements.

No other tissue in the body presents such striking instances of this harmony between form and function as the nervous system, just because its function is the most complex and the most finely adjusted of all. Let me illustrate this by one of its most striking examples. The branched nerve-cells (multipolar cells) in the central nervous system are, as a rule, distinguished in different places by their peculiar form and arrangement. Indeed, the regular function of the parts of the nervous system depends not only on the form of the cells but in no less a degree on their arrangement, as the function of a watch depends not only on the form of the wheels but also on their arrangement in a definite order. For instance, in the cortex of the cerebellum there is a very remarkable arrangement of the cells which shows the same character throughout the whole cortex, whilst the form and shape of the cells, the extension and form of the cell processes, and their place in the cortex is as fixed as the arrangement of the different elements. It forms a pattern, a structure of the most strongly marked regularity. This we can understand when we bear in mind that one of the functions of the cerebellum is to regulate and coördinate the stimuli sent out by the cerebral cortex, so that coördinated movements of the different parts of the body result. Now in most animals after birth the movements are, for the greater part, not yet coördinated, and the coördination develops only slowly. The definite regular arrangement of the cells in the cortex of the cerebellum also develops very slowly. But a chicken, for example, must be able to stand, walk, pick up its own crumbs, and drink water as soon as it is hatched; in short, its movements must be coördinated immediately after birth. Yet two days before birth the cerebellum, which has only had such a short period for development, is still in an extremely undeveloped embryonic state. Development of the regular structure sets in all at once and the cells change to their definite form as a flower unfolds itself out of the bud when the sun is shining. They change place, arranging themselves in their definite pattern so quickly that they seem to fall through the surrounding glial tissue like raindrops from the sky, and leave hollow strands behind them. Within 24 hours the embryonic mass of cells is changed into the definite structure characteristic of the adult cerebellar cortex, and when the chicken is hatched it is able to live its own life, to walk, to run, to eat, and to take shelter under the wings of the mother hen.

The same phenomenon may be met with everywhere in the cerebral cortex, though the rate of growth is usually not so quick as in the avian cerebellum. The chief and most important factor of growth in the central nervous system is that it is an organised growth, that there is formed everywhere a distinct and most complex structure in which every cell has its allotted place and forms its own special synapses and which changes its features in every part of the brain, so that a specialist may tell from which region of the brain a section is taken by looking at a microscopic preparation made from it. In this process of growth there is nothing to indicate that a struggle between the different cells is going on, in which the "fittest" or "strongest" cell survives and takes the place of its weaker brothers, as was the dogma—the slogan—of biologists in the nineteenth century. On the contrary, we see everywhere the most exquisite harmony, in which every detail of structure has its own value according to the relation of its function to the function of the whole. When we study the development of the structure of the brain and its histology from this point of view, we can understand why it is impossible that there should be a constant renewal of the elements of the nervous system like that of many organs where, even in such compact structures as the epithelia, a continuous covering of the underlying tissues without defects is necessary and a constant dying-off and renewal of the cells is taking place. Every ganglion cell has its allotted and fixed shape and place, and when a part of the brain has reached its definite structure this must be fixed and permanent during the life of the cells which have combined to build up the structure. When a cell is lost by senescence, inflammation, or neuronophagy its place remains empty and cannot be filled up by another element. Thus, the loss of nervous elements in senescence is and must be irreparable and we can understand why many authors saw in this destruction of the nervous elements the true cause of natural death. On the other hand, the process of growth must be otherwise than in those organs in which a constant renewal and increase of cellular elements takes place. The brain is fully developed far earlier in life than the other tissues of the body. After it has been fully formed the ganglion cells of which it is built up seem to be fixed, unalterable units.

Memory and Mental Development.

And yet the functions of what we call our memory require a constant changing of the elements of the nervous system. The question of memory and learning and mental development is a very difficult and complicated one, which includes a number of different fields of investigation. We enter here upon the domain of psychiatry, of the higher consciousness, of the central and peripheral consciousness, of the subconscious mind; in short, upon the domain of the mind and of all these conceptions and terms in which the things of the mind are discussed. There is just now only a very vague and remote connexion between these conceptions and the terminology of psychiatry and the anatomical facts of neurology. The reflex theory of Sherrington, laid down in his masterly work on the integrative action of the central nervous system, based upon the fundamental principles of neurology and reflex action of Hughlings Jackson and Mott, the anatomical conceptions of the "horme" and "mneme" of Monakow, the anatomical facts and descriptions of Kinnier Wilson, of Nissl, of Winkler, of Magnus, have been pushed into the background by the psycho-analysis of Freud and the phenomenology of Jaspers, and according to the newer psychiatry the pathology of the mind seems to depart farther and farther from the anatomical basis, built during fifty years by the incredible labour and energy of a host of neurologists. Even the biochemist of the future, according to Mathews, has to be more than an electrical engineer; he must be a poet and a psychologist as well.

Even when we fully acknowledge the truth of what the phenomenologists say: that neurology has not yet been able to give us a sound and solid basis of anatomical facts upon which to build conceptions of mind and memory, there is no need to leave this solid ground. Material changes in the histology of the nerve-cells must be responsible for the permanent changes in mind and its behaviour towards the world. But these changes will, of course, be found only in the most intimate and delicate structure of the protoplasm of the cells, and will leave the general form and constancy intact. In the first place, while the cells as physiological units remain independent of each other, delicate threads, growing out from the neurite processes, travel through the glial tissue, reach other cells, and become connected with these by extremely delicate endings—the synapses of Sherrington. In this way new connexions are formed between the different cells, new paths along which the nervous stimuli may pass from one cell to another. Already existing threads may branch and thus reach new cells, and it is clear that in this way, while the cells remain unaltered, their form does not change, and the structure of the whole keeps its character, there arise new possibilities of stimulation and association by which the mental activity is enlarged and new associative properties are created.

The only difficulty lies in the assumption that these association fibrillæ grow out actively and independently as new collateral threads. For immediately the question arises: by what influence are these delicate fibrillæ, lost in the dense thicket of glial fibres and other nerve-cell processes, guided to the nerve-cell with which they establish a new connexion? Many investigators (Monakow, Nissl, Held) have supposed that they do not grow out independently, but that there exists throughout the nervous system a sort of fundamental network of living substance, exceedingly delicate, which unites all the nervous elements in a syncytial mass, and in which new paths for the conduction of the nervous stimuli may be differentiated. Others, however, conceive the outgrowth as an independent cell process growing out from the cell and reaching the other cell, guided by glial tissue cells and by extremely weak electric currents (or neurobiotactic influences, as Kappers supposes), but remaining an independent thread from beginning to end, because in their preparations they do not see anything which might be interpreted as the morphological substratum of these influences. Here we need only state that these outgrowing threads are formed and that by them new associations may be built up.

In the second place, the conducting apparatus of the cells themselves may be altered, and the existing connexions between different cells change their structure, thus causing the stimuli to pass more easily and quickly along one path than along another. Here we enter upon the much-debated and still debatable domain of the internal structure of the nerve-cells and its bearing on the problem of the conduction of the nerve impulses and the generation of new impulses. The nerve-cells may be connected with each other by their cell processes. Such a cell process may end in a sort of ramification which envelops the protoplasmic body of the nerve-cell with which it is connected. In certain cells these ramifications may be coarse and form a calyx-like investment to the cell body; in other places the pericellular fibres of the terminal ramification are very delicate and form a fine arborisation. Where these fibrils come into contact with the surface of the cell, they may end in small button-like enlargements or varicosities. In all cases we say that the nerve-cells are linked together by a synapse. Although the physiological changes—the nerve impulses—are propagated, stepping over, as it were, from one cell to the other at each synapse, there is evidence that in the transmission of nerve impulses from one cell to another a block always occurs at the synapse, causing a slight arrest or delay in transmission, and that nerve-impulses pass the synapse in one direction only. Apparently the nerve impulse is changed in passing from one cell to another. Is this change permanent and unalterable?

Those morphologists who regard the nerve-cells as independent units usually regard these synaptic connexions as consisting of dead matter, a sort of cement substance gluing the terminal buds or ramifications to the surface of the cells with which the endings of the nerve processes are in contact, or as a sort of transverse membrane across the conducting structures, which are then regarded as more fluid (Sherrington). No alterations in this dead matter seem to be possible, and the conducting substance of the afferent cell processes would be entirely separated from the conducting substance of the nerve-cells to which they are glued. Now this would be very difficult to understand. It seems impossible to conceive a stimulus passing from one nervous element to another through a non-living membrane or a cement substance without disintegrating. There must be living substance between. Even the hypothetical synaptic membrane of Sherrington must be an arrangement of units of the living substance. This living substance must be able to transmit the nervous stimuli. Now, as far as we know at present, the histological evidence tends more and more towards regarding, as the real conducting apparatus of the nervous elements, the exceedingly delicate fibrillæ inside the protoplasm of the nerve-cells and their cell processes. These neurofibrillæ are found throughout the whole nervous system everywhere where nervous impulses are conducted in a definite direction. In the peripheral junctions, where the impulse has to be transmitted to a muscle-fibre or a sensory impulse has to be transmitted from a tactile cell to the sensory nerve-fibre, we find an intermediate structure, a very delicate protoplasmic network, connecting the neurofibrillar structure with the protoplasm of the end-organs (the muscle-fibre or the tactile cells). So in the peripheral junctions we find a real protoplasmic connexion between the two, with a structure enabling it to transmit the nervous stimulus.

When we regard the connexion between the nerve-cells in the central nervous system—the synapse—as consisting of living substance in and through which the nervous stimulus may be transmitted, we must make clear both the possible mode of transmission of this stimulus and also the physiological independence of the nerve-cells and the anatomical nature of the synapse as a secondary connexion differing in character from both the connected parts. The only way to do this is to regard the intervening substance of the synapse not as a sort of non-living cement but as a living substance, in which there is a structure akin to the intermediate substance of the peripheral junctions and which connects the neurofibrillary endings of the cell processes with the conducting apparatus of the nerve-cell itself. As a living substance the synapse may obtain such an arrangement of its living units composing the conducting protoplasmic apparatus as is more suitable for a quick and unweakened transmission of the stimulus. Inside its protoplasmic substance there may be formed a more complex organisation of its linear (neurofibrillar) structure, or a transient part of this linear structure may become fixed; in short, inside the synaptic living substance the conducting apparatus may become more and better organised. In this way it might be possible to explain those alterations of the transmission of nervous stimuli by which stimuli coming from particular cells are enabled to follow a particular path of transmission more quickly and easily than another path, and so to give rise to one distinct complex of reflex actions. This phenomenon—that a certain stimulus, unimportant in itself, gives rise to a distinct set of reflex actions, that in their turn may be the cause of other well-ordered actions and so regulate or alter our mental activity—creates what we call memory, our remembrance of things in the past that regulates and governs our existence, our life.

Thus, even in a permanent structure like the nervous system there is room for alteration, for growth, and for amelioration (and on the other hand for deterioration), within the boundaries of normal structure. By this is determined its intrinsic value for our health and existence.

Agduhr, who investigated the structure of the spinal cord and the nerve-roots, suggested that even the unalterability of the nervous system as a whole after birth may not be so absolute as is generally assumed. He subjected young dogs to a very severe and prolonged muscular training, and counted the nerve-cells and nerve-fibres belonging to the muscles which were thickened and strengthened by the training process. He found a distinct progressive alteration of the number of nerve-cells and fibres and concluded that, even in a nervous structure already formed, a branching of nerve-fibres and an increase of the number of nerve-cells is possible, at least in the much simpler structure of the spinal cord and spinal ganglia. Further investigation is necessary here, and indeed we are still on the threshold of this field of inquiry, but it may be sufficient to show that, even in the permanent structure of the nervous system, health is a process of movement and never of stagnation. It is only in this way that we can understand all those other phenomena of the nervous system, the phenomena of regeneration which in the higher animals are studied almost exclusively in the nervous system, the curious phenomena of the vicarious action of the different parts of this system after one part of it has been destroyed, the action of the glial elements in disease, and so many other problems of the nervous system in health and disease.

ILLUMINATION AND PRINT.

AT a meeting of the section of State Medicine of the Royal Academy of Medicine in Ireland held on Jan. 17th, the President, Prof. W. D. O'Kelly, urged the need for fixing school standards of adequate and correct illumination and not merely minima; he thought a foot-candle-meter should be used on a dull day and actual readings taken in the rooms. No child should be condemned to sit the whole year in a badly lighted place; pupils should be changed round during the day unless conditions were ideal. Artificial illumination was merely a stop-gap arrangement in existing buildings. Children under 12 should not be allowed to use school books with letters less than 1·75 mm. high, nor less than 1·5 mm. high at any time during school life. If it were necessary to economise he would prefer a page and type twice the size printed on a cheaper paper. One of the objections to the use of small type was that the ascending and descending parts of the letters were reduced more than the other portion. The eye picked out in reading the upper part rather than the whole letter, and as all the capitals were ascending letters and ascending lower case letters occurred more frequently than descending ones it was rendered doubly difficult for the child to read small type. When illumination was insufficient a great strain was thrown on the eye and damage frequently resulted.

The Irish type was, said Prof. O'Kelly, pleasing to the eye. Irish texts set up in roman type did not look so well, especially when "h" was substituted for the aspiration mark. He did not think the Irish type would be replaced by the Roman any more than the Venetian had replaced the English black letter, although the former was a simpler type. The Gothic varieties, although more difficult, were more pleasing. The print in school books in the Saorstat was good in the majority of those he had examined; it averaged 10–11 point. But he would prefer 12 point. If used in model by-laws why not in school books? In three of the seven grammars on the approved list the print was too small; in the exercises of one of these the small letters were only 2 mm. high. Dr. M. O'Leary, however, remarked that even in schools which conformed to the rules laid down by the Local Government Department the percentage of cases of bad vision was nearly as high as in those which did not; it had recently been stated that 50 per cent. of the eye troubles in children were hereditary and were not in any way due to faulty illumination in the schools.

CICELY NORTHCOTE TRUST.

THE social service department at St. Thomas's Hospital, founded in memory of his sister, by the late Mr. H. S. Northcote, publishes its twentieth report this year. The Fathers' and Mothers' Club, which provides classes on all kinds of home-making for mothers—while their children are tended for them in another room—and debates and social evenings for fathers after working hours, is as popular as ever with the parents who own it, but is sadly in need of money to enlarge its space. Nearly 9000 patients have been visited in the wards by Northcote Trust workers, who try to establish what the Americans call a "100 per cent. contact," so as to smooth the path for them from the warm shelter of the wards to the stark realities of life at home. Where necessary, the ward visits are followed up by home visits, and any kind of assistance is given, varying from the provision of an ambulance to all arrangements for convalescent treatment and the care of the family while the patient is away. The Northcote Trust almoner is responsible for arranging the supply of insulin to diabetics who have been discharged from hospital. She has to decide whether it can be obtained through a panel doctor or through hospital at a reduced price, or, if not, how the patient can meet the demand on his purse. Another group of patients over whom the Trust watches with especial care are the cancer cases. All patients discharged with cancer are visited at regular intervals to make sure that they are not in want, and that they have the necessary dressings, diet, and nursing comforts. During last year, for instance, four wheeled-chairs were given to cancer patients, over 1200 of whom were watched. The Northcote Trust Hostel admits unmarried mothers and pregnant girls who need treatment, and tries to give both mother and baby as good a start in life as possible. Thanks largely to the influence of America, social service has come to be recognised as one of the most important aspects of a hospital's work. The pioneer efforts of the Cicely Northcote Trust have been appropriately recognised this year by a request from Australia for a visit from the head worker, Miss Macintyre, to inaugurate a centre of work and training at the Melbourne Hospital. We hope it will not be long before every hospital in this country considers itself inadequately equipped unless it has a social service as efficient and as devoted as that at St. Thomas's Hospital.

A DOCTOR IN A NOVEL.

ON Oct. 18th, 1929, Dr. Luke Serocold, one of a firm of three practitioners who shared the work of a small country town with one rival, paid six professional visits to private patients; attended a meeting of the Town Council as Medical Officer of Health (part-time); and performed a radical mastoid operation. At 2.30 A.M. he was watching the death of his senior partner; at 11.45 P.M. he was giving the anæsthetic while his assistant delivered a child.

Dr. Serocold, it must be admitted, is only a character in fiction created by Miss Helen Ashton, whose novel centreing round his day's work, has just been published.[1] But he will be recognised as a typical family doctor, who has reached an age when he is even more interested in the struggles of his patients to adapt themselves to their environment, than in their physical disorders. We see their problems through his kindly eyes, mourn with him for his doomed friend, and rejoice in the brave indiscretion that costs him his best patient. Some readers of the book might have preferred to observe the behaviour of the neighbours and patients and to draw conclusions about their emotional life, instead of only seeing them reflected in the doctor's musings. The majority, however, will be content to follow Dr. Serocold through his day's work with the respectful attention he deserves, rejecting the suspicion that in real life he might have been a bore. Since women doctors in fiction are often incredible, a word of praise is due to Miss Ashton for her sketch of Dr. Jean Gordon, a young assistant of pleasant demeanour, who is competent without taking herself too seriously.

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[1] Dr. Serocold. By Helen Ashton. London: Ernest Benn, Ltd. 1930. Pp. 288. 7s. 6d.

Hunterian Lecture

ON THE

SURGICAL TREATMENT OF CARCINOMA OF THE CERVIX.

Delivered before the Royal College of Surgeons on Jan. 27th, 1930,

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THE modern surgical treatment of carcinoma of the cervix dates from 1895 when Ries, of Chicago, suggested a method of radical extirpation by the abdominal route, the main feature of which was the dissection of the ureters from out the neighbourhood of the growth. This operation was actually carried out by W. W. Clark in 1896, and shortly afterwards Thring, of Sydney, devised a similar procedure. In 1898 Wertheim, of Vienna, began to perform an operation on the same lines as those suggested by Ries, but he improved it by placing clamps across the vagina, whereby the growth was cut off from the uninvolved vagina beneath it so that the risk of cancer infection was avoided. His operation was looked at askance by the gynæcological surgeons of that time and provoked much adverse criticism; but by rare courage and persistency he succeeded in forcing its value on a doubting surgical world, and it is by his name that this great advance will for ever be known.

The greatest feature of Wertheim's contribution to surgery was that it doubled the percentage of patients who could be operated on. Up to the time when his operation was accepted, patients with carcinoma of the cervix, if able to be operated on, were subjected to vaginal hysterectomy, and in not more than 25 out of every 100 presenting themselves was the growth early enough to permit of operation; whereas, by the new procedure 50 per cent. or more were able to be surgically treated, and further, the more than doubled operability rate was accompanied by a much increased five year survival rate.

The first British surgeon to perform it in Great Britain was Cuthbert Lockyer in July, 1905, shortly before which date he had assisted Wertheim himself to perform it at Plaistow Hospital.

My first Wertheim's operation was undertaken in the spring of 1907, since when I have performed it 382 times. Compared with operations on the stomach, gall-bladder, and so forth, series of which running into four figures have often been published, this may appear to be a small number, unless it is remembered that carcinoma of the cervix, though too prevalent, is not very common, forming only about 1·4 per cent. of the diseases peculiar to women: moreover, the clinical material from which large series of cases can be abstracted is far less abundantly supplied to the individual surgeon in this country than on the Continent, where the professorial system places an enormous amount of it at the sole disposal of the professor. My colleague, Comyns Berkeley, also carried out the first of his series in 1907, since when he has performed it between three and four hundred times, with results very similar to my own. Certain other British surgeons about that time also began to practise it, and from then till now it has been frequently performed in this country. It may be wondered, therefore, why it is that so few papers dealing with the results of long series have not been published here. There are two reasons. The first is that though many surgeons here have essayed it, comparatively few (for one reason or another) have done so on a large scale. The second is, that very few of those who have performed it in quantity have persisted in the labour of keeping in close touch with their patients over the long period of years necessary before the results of a series can be properly presented. The difficulty of keeping in touch with these patients, belonging as they mostly do to the poorer classes whose habitation is constantly changing, is very great. The Continental professor has at his command a number of assistants to whom he can delegate this work, whereas the British surgeon works more or less *solo*; and if he wishes to keep in touch with his patients he must do it for himself. Some sort of follow-up system is beginning to be organised at most large hospitals, but this is of quite recent date and still very imperfect.

RESULTS OF THE OPERATION.

Of the 382 Wertheim operations that I have carried out 284 were performed by the end of 1924, and this number therefore are available for examination on the basis of 5 years' freedom from recurrence. My results are as follows:—

Died of operation	47 (16·5 %)
Recurrence before 5 years	107
Lost sight of before 5 years	12
Died of other diseases before 5 years ..	8
Well at end of 5 years	110
	284

Operative Mortality.—The high operative mortality was the principal objection raised against Wertheim's innovation. He had 30 such deaths in his first 100 operations. Increasing experience and technical skill enabled him to bring the rate down to under 10 per cent. in his later cases. This has been, I think, the experience of all surgeons who have performed it largely. In my own case it has certainly been so, thus, I performed:—

			Per cent.
From 1907 to 1915,	110 operations	with 22 operative deaths	..20
„ 1916 to 1924,	174 „	„ 25 „	„ ..14·3
„ 1925 to 1929,	98 „	„ 8 „	„ .. 8·1

Two questions are at once suggested. (1) To what are these deaths due? (2) What brings about their diminution?

The Causes of Operative Deaths.—The severity of the operation itself is less a factor in the death-rate than are the conditions general to the patient herself and local to the seat of the growth. A very considerable proportion of women suffering from cancer of the cervix are in very poor health, quite apart from the growth; in fact, I believe that very few develop cancer in that situation until their general condition from other causes has considerably deteriorated. The average age of these patients, moreover, is somewhere about fifty years. Of the 382 women I have operated on 14 were over sixty years, and 3 over seventy years. There were 23 patients under thirty-five years of age, 6 of whom were under thirty, but my general impression is that not much more than one or two of these young persons were in normal health—quite apart from their disease. The poor general quality of the clinical material with which the surgeon practising Wertheim's operation has to deal is paralleled in cases of cancer of the stomach and rectum; the surgeon in all three instances is handicapped from the start.

Nor is the local condition less important. The majority of cancers of the cervix are heavily infected by the time the patient seeks advice and some of them very intensely; so that the risk of post-operative infection of the operation area, even with the utmost precautions, is always present. How intense such infection may be is shown by the fact that Berkeley and I had amongst our early cases several examples of gas-gangrene of the abdominal wound exhibiting the typical black sphacelus of the muscles and foul effervescing pus, with which later on the war made all surgeons familiar.

Of the 382 patients on whom I have operated 55 died as the result of the operation, and the causes are as follows:—

Traumatic shock	20	Paretic obstruction ..	3
Hæmorrhagic shock ..	5	Peritonitis	2
Septic shock	13	Embolism	2
General sepsis	2	Suppression of urine ..	1
Pyelonephritis	3	Anæsthetic	1
Thrombosis of femoral artery	1		55
Secondary hæmorrhage ..	2		

The term "septic shock" describes that state of collapse which follows operative disturbance of an area already heavily infected and which is probably due to the manipulation suddenly launching into the circulatory fluids of the body a heavy dose of toxins or bacteria. It is most typically seen in cases in which the operative manipulations are too slight in themselves to cause shock, as, for instance, simple drainage of a big pelvic abscess. The symptoms differ from those of traumatic shock in that the patient is not pallid, but flushed and sweating, and the temperature is markedly raised. Death occurs within 48 hours as a rule. Including the deaths from general sepsis, peritonitis, and secondary hæmorrhage (which is always due to sepsis) it is seen that 19 of the deaths were due to infection, against 20 due to the sheer trauma of the operation.

Under the heading "hæmorrhagic shock" fall those cases who died as the result of bleeding during the operation. The loss of blood was not due to arterial or venous bleeding, but to a persistent oozing universal to the whole area operated on. These cases are fortunately rare, for the oozing cannot be stopped by forceps or ligature, and all that the surgeon can do is to get through the operation as quickly as possible, in which endeavour he is constantly being thwarted owing to his landmarks being obscured by blood.

Three deaths from pyelitis are less than might be expected, seeing the frequency with which infection of the urinary tract complicates convalescence. This frequency is partly due to the absolute paralysis of the bladder which always follows the operation, and which may endure for as long as two or three weeks, during all of which time catheterisation is necessary; but it is chiefly due to the bareing and displacement of the bladder whereby it backs into the free space left by the extirpation—a space which probably always becomes more or less infected.

REASONS FOR THE PROGRESSIVE DIMINUTION IN OPERATIVE MORTALITY.

My operative mortality has fallen from 20 per cent. in my first 100 operations to 8 per cent. in my last 98, and this fall has not been due to any change in my standard of selection. It is the result of a number of small improvements in the technique of the operation, each of which has been devised to shut the door against the repetition of some difficulty or disaster of the past—in short, it is due to utilised experience. I will therefore proceed to discuss in some detail those points in the technique of the operation by observance of which I have been able so markedly to lower my operative mortality.

TECHNIQUE OF OPERATION.

The Anæsthetic.—For an operation in which traumatic shock accounts for over 30 per cent. of the operative deaths, the advantage of spinal anæsthesia to block shock impulses is manifest, and I have employed it since 1910, combined with full ether anæsthesia. The reason for preferring ether to gas and oxygen is that it is a powerful stimulant, and tends to counteract the fall in blood pressure which spinal anæsthesia occasions—an important point, because so many of the patients are in poor general condition to start with. The utmost possible relaxation of the abdominal muscles is necessary in order that the surgeon can see what he is doing, and no one should undertake the operation unless he can count upon his anæsthetist to attain this safely. I have had the advantage of having as anæsthetist for the large majority of my cases Dr. Herbert Charles, whose unique experience with myself and Comyns Berkeley comprises nearly 700 of these operations.

Sterilisation and Packing of the Vagina.—The important step of sterilising the vagina is best effected by packing the canal with gauze soaked in violet green, the adoption of which for this purpose in 1916 was immediately followed by a remarkable lessening in post-operative sepsis. The vagina should be packed under the anæsthetic before the abdomen is opened, and it is essential to pack it tight right up to its vault, for unless the canal is made into a solid column, the separation of the bladder and rectum from it is rendered difficult and dangerous.

Protection of the Abdominal Wound.—It is probably impossible to absolutely sterilise a foul growth, and if any organisms are transplanted from it to the abdominal wound the latter will break down more or less seriously. To protect it, Berkeley and I, as a result of our unfortunate early experiences, soon began to wrap its edges with sheet rubber. I now use two layers of rubber, the first of which is attached to the skin by clips, whilst the second goes on with the retractor to which it is attached, and covers the whole thickness of the wound edges. An automatic retractor is a necessity in order that the operation area may be fully exposed and clearly seen, for many of the patients are very stout and the surgeon is working at a great depth surrounded by highly important structures, an accidental wound of which immediately deprives the patient of half of her chances.

On Separating the Bladder and Rectum.—The bladder and rectum should be separated by sense of touch; the former with the thumb kept pressed against the solid column formed by the packed vagina so that the flat of the thumb-nail rests against the bladder; and the latter by the first and second fingers, the pulps against the vaginal column, and the flat of the nails against the bowel. If the bladder is opened by accident, it should be sutured and the bladder should be drained, but a fistula may form. If the bladder is greatly thinned in the process of separation it may necrose later with the same result. I have had five vesical fistulas, of which two closed spontaneously. Accidental holeing of the rectum is a great disaster, for most of these cases die.

On Finding the Uterine Artery.—Fix forceps to the stumps of the cut round ligament and ovariopelvic ligament respectively, and get them pulled outward, meantime the uterus is pulled to the opposite side. With the fingers tease away the light cellular tissue in the upper part of the broad ligament until the external iliac vein is exposed. Work down the side of the pelvis, looking for the cord of the hypogastric artery which is running parallel to and inside the vein and about an inch below it. In easy cases the uterine artery can now be seen coming off it at right angles. If you cannot see it, feel for and expose the ureter as it runs on the posterior peritoneal surface of the broad ligament, and be sure that the artery is not running parallel to and just above it, as it sometimes does. If you still cannot see it, gently push the index finger down into the broad ligament just outside the ureter and see if you can hook forwards under the artery and lift it up. If this fails, as it may do when the tissues lateral to the cervix are indurated by growth or inflammation, work back along the hypogastric artery till you come to the internal iliac trunk and ligature that.

On Exposing and Isolating the Ureter.—Having divided the uterine artery close to its branching from the hypogastric artery, gently peel its distal end towards the uterus and the ureter will be exposed underneath it. If you have had to ligature the internal iliac, follow the ureter forwards from where it lies on the peritoneum to its junction with the bladder, cutting forwards with scissors in a line outside and parallel to it. You will presently divide the uterine artery; its proximal end will not bleed, though its distal may do. Pick up the distal end and peel it back to the ureter as before. It is necessary to completely isolate the lower two inches of the ureter up to its junction with the bladder, for unless this is done the cardinal ligament which lies below it cannot be properly exposed or safely divided. More than two inches should not be isolated if it can be avoided, for fear of necrosis.

On Grafting the Ureter.—In advanced cases the ureter may be so embedded that it cannot be dissected, or may be nipped about half an inch from the bladder and dilated above the stricture. If the growth is not irremovable on other counts (as it often is) the best course, instead of wasting time in dissecting out the ureter, is to divide it above the point of embedding, and having completed the extirpation, graft it into the bladder. I have done this deliberately nine times, and once more on the single occasion when I accidentally cut the ureter, and in all ten of the operations the graft held. Ureteral fistulæ following the operation are due to necrosis of the duct by the combined effects of "isolation anæmia" and septic infection of the extirpation cavity. They develop in from five to ten days after the operation. I have had eight such, four of which closed spontaneously; two were treated by nephrectomy, one was successfully grafted into the bladder, and one remained open until the patient died of recurrence.

On Dividing the Cardinal Ligaments.—All the foregoing steps in the operation lead up to and are the necessary preliminary to what is in effect the essence of the operation—namely, the division of the cardinal ligaments. These ligaments consist of a couple of broad fan-like fibromuscular expansions which, rising one on each side from the lateral wall of the vagina, are attached to the side wall of the pelvis. Not only do they fix the vagina, so that until they are divided the mobilisation necessary before it can be cut sufficiently low down is impossible, but the main lines of growth infiltration and permeation run outwards in their upper part, so that the division needs to be made as near the pelvic side wall as possible. A surgeon who has never properly performed Wertheim's operation has never seen these ligaments for no other operation exposes them, so deeply hidden are they by the structures that overlie them. The ureters rest on their front and upper surfaces, whilst their back and lower surfaces are separated from the pararectal tissues and lateral rectal ligaments by fibro-fatty wads of tissue. It is unnecessary to clamp them before dividing them, as the few vessels they contain are small and can be picked up with forceps. Not until they are divided from top to bottom is the vagina really free. The division, except in the easiest of cases, has to be carried out largely by sense of touch, and it is this, I think, that makes Wertheim's operation, of all recognised surgical procedures, the most difficult to become expert in. During the division, which must be done with long bent scissors, the vagina and uterus should be strongly pulled to the opposite side, and the index finger should be hooked under the ligament both to hold it up and to guard against the rectum being injured.

On Suturing or not Suturing the Vagina.—I began by following Wertheim, who only removed enough of the vagina to cover the cervix; but for a long time now I have removed the whole or nearly the whole of it. In my earliest operations (again following Wertheim) I left the vagina open and packed the extirpation cavity with gauze; later on I gave up packing but left the vagina open; and later still I took to suturing it up and leaving the cavity undrained. If, however, the whole of the vagina is removed it is impossible to suture the open end, which is practically at the vulva, because the bladder overhangs it too much, so that I have now gone back to packing the extirpation cavity, using gauze wrung out of a 1 in 2000 solution of flavine, which is removed in 24 hours via the vulva. I believe this to be the best technique, for it saves the time taken to suture the vagina, whilst flavine is somewhat of a styptic besides being a strong antiseptic.

Removal of the Regional Glands.—Wertheim himself removed the regional glands only when he deemed them to be cancerous, but from the beginning I have removed them as a routine. There are two groups of these glands on either side: (*a*) those lying along the inner side of the iliac veins, and (*b*) those lying in the obturator fossæ. The second of these two groups is the most important, for it is the earliest to become permeated and it is also the one most likely to escape observation because the contents of the obturator fossa are hidden by a screen of tissue in whose upper edge runs the hypogastric artery. The glands along the iliac veins are easily seen and stripped off, but to get fair access to the obturator fossa it is necessary to remove the hypogastric artery. This is effected by dividing it at the lateral corner of the bladder and pulling it back up to its origin from the anterior trunk of the internal iliac artery, where it is ligatured and again divided.

The fossa is filled with a wad of fatty tissue, which has a rat-tail extension downwards and forwards almost as far as Poupart's ligament. The glands lie in this fat, and the obturator nerve which traverses it must be gently disengaged, care also being taken not to injure the obturator artery or veins.

When the surgeon comes to deal with the fossa on his side of the table he should cross to the other side so that he can see what he is doing; otherwise he stands in danger of injuring the tributaries of the internal iliac vein which run in the same line as the hypogastric artery, but half an inch or more deeper down. This track of tissue is a danger zone and one should keep clear of it unless it is infiltrated; for if these veins, which form a regular plexus, be opened, free bleeding follows, very difficult to arrest, and much time and blood is lost.

DURATION OF THE OPERATION.

Every operation has an optimum time-period for its accomplishment, the duration of which depends on the nature of the various risks of the operation, and the proportion they bear to the total risk. Thus, in the case of an operation whose principal risk is the bleeding accompanying it, or the effect of the anæsthetic, or the exposure of large raw surfaces, the shorter the time of its performance the better. On the other hand, in procedures whose chief danger lies in the possibility of a suture line not holding, or of infection of the operation area from adjacent areas already infected, or of injury to vital organs or parts in its immediate neighbourhood, meticulous accuracy in suturing, painstaking antiseptic technique, and delicate dissection are the essentials for success, and the time taken counts for little in comparison.

As regards the effect of tissue injury, it is important to remember that it depends not only on the actual amount inflicted, but also on the time-period over which the infliction is spread. Thus, a pound weight dropped on a man's head from a height of a yard would certainly stun him; whereas a half-ounce weight dropped from the same height 32 times at intervals of a minute would merely give him a sore head. Traumatic shock is the result partly of tissue injury and partly of tissue exposure; and of these two factors the first (other things being equal) is minimised by slowness, and the second by speed. The optimum time-period of performance of an operation will therefore be most often arrived at by the surgeon who strives to reconcile the conflicting claims of the several risks involved in it, and not by him whose object is merely to get through it as fast as possible. For Wertheim's operation, entailing as it does much tissue exposure and more or less continuous oozing of blood, it is obvious that a certain rapidity of performance is always desirable, and more especially in those cases to which I have referred in which the oozing is profuse. Assisted by Louis Rivett I once performed it from start to finish in 27 minutes, and on several occasions I have accomplished it in under 40 minutes. Nevertheless, I have of recent years made speed less of an objective than I used to do and concentrated more on accuracy of detail, to the betterment of my results. It is impossible to lay down a rule because cases vary so much in difficulty, but on the average I should estimate that the operation should take about an hour and a quarter. The surgeon should, however, have at his command sufficient dexterity to shorten this time very materially if in any particular case it is desirable.

Immediate After-Treatment.

Some patients are considerably shocked by the time they leave the table, but a much larger number develop symptoms of shock an hour or more afterwards as the effect of the ether wears off. To combat shock I used to fill the abdominal cavity with warm saline just before finally closing it, but this is only practicable if the end of the vagina has been sewn up. Saline venous infusion is of the greatest value if it is carried out *immediately* after the operation, but the longer the time allowed to elapse before it is resorted to the less good will it do. I therefore nowadays often administer it on the table, even in cases whose condition appears quite satisfactory, so as to anticipate the supervention of shock symptoms some time later. Blood transfusion has proved of enormous benefit, especially in cases of delayed shock for, unlike saline infusion, which only gives good results when administered immediately, it acts equally well some hours after the operation.

Continuous saline infusion into the cellular tissue is a good adjunct to venous infusion and may be ordered in those cases in which the patient's condition is good enough not to need venous infusion. An electrically heated cradle should be employed during the period of shock, and camphor is the best stimulant to use.

Recurrence of the Disease.

About 68 per cent. of all recurrences occur before the end of the second year, and 90 per cent. before the end of the fifth year. Of the 107 recurrences in the series I am presenting here, 21 occurred in the lower pelvis—that is to say, in the remains of the vagina, the bladder, or the rectum; 49 in the upper pelvis, chiefly in the cellular tissue along its side walls, or in the pelvic bone itself, and in the track of the iliac vessels; 28 in the abdomen, chiefly in the tissue behind the peritoneum, or in the vertebræ; 7 in the lung; 1 in the brain; and 1 in the skin as multiple nodules. In this case the growth was a pure columnar-celled adenocarcinoma, which is uncommon in the cervix. Of the 284 cases, only 10 had this type of growth, though a tendency to columnar formation is not infrequently seen in patches in many carcinomas of the cervix, and I have seen an alveolar arrangement in the primary growth with an adenomatous arrangement in the secondarily affected glands.

Secondary growths are very rarely susceptible to further operative treatment and practically only when they occur in the remains of the vagina; of the few of that sort that I have removed all the patients died of further recurrence. I have on rare occasions, when the patients were quite young women, conserved an ovary. In two of these cases the growth recurred in the ovary left behind, and in one of them I was able to remove it. The operation was performed over ten years ago and the patient is still alive!

A considerable proportion of the patients who exhibited recurrence were treated by radiation, chiefly by X rays, but some by radium, but not one was saved.

Radiation as an Adjunct to Operation.—The vast bulk of the patients operated on by me received no treatment by radiation beforehand. Of the few that did, with a view to "making the growth operable," every one has died, either as the result of the operation or by rapid recurrence afterwards. I am of opinion that radiation, if a considerable interval has elapsed between it and the operation, increases the surgeon's difficulties, and that in those cases in which it has been claimed that it turned an irremovable into a removable growth the case was really operable before the radiation, only the surgeon did not know it. Moreover, I believe with Heyman that the chances of radiation producing a good effect are largely spoilt if the part radiated or to be radiated is subjected to operative disturbance, because the tissue reaction, to which equally with the damage done to the tumour cells the good effects of radiation are to be ascribed, is interfered with.

None of my patients has been treated by radiation after the operation, except in a few cases in which I was obliged to leave gross masses of cancer (either in the form of malignant glands or infiltrated cellular tissue) on the side wall of the pelvis because they were irremovable. These patients were treated by X rays directed to the area where growth was known to remain, but not in one single instance did the treatment prevent the cancer pursuing its fatal course.

Five-Year Survivals.—Of the 284 operations, the results of which I present to you to-day, 110 of the patients were free of recurrence five years after their respective operations. The relative cure-rate, or the proportion of five-year survivals to the total number operated on, is therefore 38·7 per cent., not deducting from the count the 20 patients either lost sight of or died of other diseases; or, in other words, counting them as having died of cancer. If, however, these 20 patients be deducted from the count as is statistically more accurate, the relative cure-rate is 41·6 per cent.*

Ten-Year Survivals.—Five years' survival after the operation cannot, however, be considered as absolute proof of cure, since about 10 per cent. of the total recurrences occur between the fifth and tenth years. Up to the end of 1919, or ten years ago, I had performed 181 operations whose results on the basis of ten years' survival are as follows:—

Died of operation	31 (17·1%)
Recurred before 10 years	67
Lost sight of before 10 years	19
Died of other diseases before 10 years ..	9
Ten-year survivals	55
	181

Counting as though they had died of cancer the 28 cases lost sight of or died of other diseases before ten years, the relative cure-rate (real cures now) is 30·3 per cent., or deducting from the count the aforesaid 28 cases, 36 per cent.

Effect of Glandular Involvement.—The chief advantage of Wertheim's operation over every other form of treatment, the results of which have up to now been published, is that it gives a definite chance of permanent cure, even to patients in whom the regional glands are cancerous by the time they seek advice. Of the 284 cases operated on by me from 1907 to the end of 1924, the regional glands removed at the operation were cancerous in 124 and not cancerous in 160. The gland involvement-rate was therefore rather over 43 per cent.

The results in these two groups of cases are as shown in Table I.

TABLE I.

—	Glands free.	Glands involved.
Died of operation	19	28
Recurred before five years ..	47	60
Lost sight of	7	5
Died of other diseases ..	6	2
Five-year survivals	81	29
—	160	124

The five-year survival-rate for the gland-free group is therefore 49·9 per cent. without deductions (see back) or, with deductions 55·1 per cent.; whilst for the gland-involved group it is 23·3 per cent. without deductions, and 24·7 per cent. with deductions. My ten-year figures show a similar difference. The chance of cure, therefore, in a case in which the regional glands are not involved, is rather over twice that of a case in which the regional glands are involved, but the difference to my mind is less to be wondered at than the fact that even when the operation is carried out against such a handicap as already involved glands, one patient in five is cured by it.

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* The former method prevents concealment of unfavourable cases.

THE ABSOLUTE CURE-RATE.

The absolute cure-rate is the proportion of five-year survivals to the total number of patients presented to the surgeon. As regards myself, this total number has to be estimated, for I have no actual figures covering the period 1907–24. Between the years 1907–11 Comyns Berkeley and myself, who were working in concert, were able to keep accurate count of all the cases seen by us, both at Middlesex Hospital and Chelsea Hospital for Women, for we were the only surgeons performing the operation in those hospitals at that time. During that period 112 cases presented themselves to us, and of these we operated on 70, or 63 per cent. From 1911 onwards it became increasingly difficult to keep such a count, because our colleagues at Chelsea had begun to do the operation too, whilst I was presently translated from the out- to the in-patient staff, so that the cases coming to the hospital were no longer entirely presented to us; moreover, Middlesex Hospital (to which on account of its incurable cancer wards an undue proportion of advanced cases had always been sent), became known as a radium centre, and the number of these became so increased that the patients presenting themselves no longer constituted a fair sample of the cases of carcinoma of the cervix in the community at large. We therefore gave up as futile the task of disentangling the cases in which we determined the treatment from those in which the treatment had been determined by others, and in all our subsequent communications continued to reckon our operability rate as 63 per cent., and to deduce the total number of patients seen from that figure.

In the figures now to be given (Table II.) the total number of cases seen by me during the period covered by the series is reckoned on the basis that my operability rate has remained at 63 per cent. throughout the period the series covers, though in fact I believe it to have been materially higher in the later years.

TABLE II.

—	Cases seen.	Cases operated.	Five-year survivals.	Absolute cure-rate (per cent.).
No deductions ..	450	284	110	24·4
Deducting cases lost sight of and died of other diseases ..	430	261	110	25·5

Though I have not been able to keep actual count of all the cases I have seen in my hospitals, I *am* able to give the number I have seen in my private consulting-room. Between January, 1910, and the end of 1920 I saw privately 140 cases of carcinoma of the cervix, and of these I operated on 113 (some in hospital and some in nursing homes) so that my operability rate for these patients is 80 per cent. Up to the end of 1924 I had seen privately 106, and of these I operated on 83, or 78 per cent. The results obtained from this *group of cases are as follows:—*

Cases seen	106
Cases operated	83
Operability rate (per cent.)	78
Operative mortality (per cent.)	9·6
Five-year survivals ..	38
Relative cure-rate (per cent.)	48
Absolute cure-rate (per cent.)	37·5

Both the "rates" are without deductions.

It may be argued that these patients, nearly all of whom were sent up to me by various medical men, form a selected group in whom the disease was early or relatively early. The percentage of gland-involved cases in the group is, however, 40 per cent., which, though less than the figure 43 per cent. which obtains in the whole series, is sufficiently high to show that in average advancement the growths were not very greatly different. On the other hand, this group of patients were in financial and social position above the average of those of the whole series and therefore as regards their general condition were superior material for operating upon. The better results obtained were chiefly due to this factor and substantiate what I said earlier in this paper—that the chief risk of the operation lies less in its severity, per se, than in the poor average condition of the patients. My chief reason, however, for giving the figures relating to this group is to show that in assuming my general operability rate for the whole of the series under consideration to have remained the same (63 per cent.) as it was when actually calculated in the four years 1907–10, I have rather under- than over-estimated it.

Comparing the results I have obtained from my series as a whole with the average results of the small group of highly skilled surgeons who have performed the operation on a large scale and also kept count of their figures, it is seen that as regards the proportion of five-year survivals to the total number of patients operated upon, my results are about the same as the average, whilst as regards the proportion of five-year survivals to the total number of patients seen they are rather better.

TABLE III.

—	Cases seen.	Cases operated.	Operability rate (per cent.).	Operative mortality (per cent.).	Five-year cure-rate (per cent.).	
					Relative.	Absolute
Wertheim	979	450	46	19	41·3	19
Mayer ..	545	343	63	19·9	31·2	19·6
Stoeckel ..	350	243	70	18·9	35·4	24·6
Zweifel ..	413	251	58	7·6	47·8	27·6
Franze ..	473	383	81	15	37	28
Bumm ..	263	179	68	12	43	28
Bonney ..	450	284	63	16·5	38·7	24·4
Fletcher Shaw..	200	106	53	21·7	37·8	20
Total ..	3703	2239	60·4	16·4	38·7	23·4

It may therefore roughly be stated that the operation when carried out by surgeons skilled in its performance really *cures* (by that term meaning survival for ten years) rather over one in three of all the patients operated on, and rather over one in five of all the patients seen.

FUTURE OF THE OPERATION.

In a paper quite recently published[1] I showed that the results I had obtained by Wertheim's operation were not only numerically better than any yet claimed for radium, but the number of five-year survivals achieved by the operation was obtained from a much smaller percentage of cases treated, for the radiologist, in order to obtain a certain number of cures, has to treat 96 per cent. of the cases seen by him, whilst the surgeon obtains a rather greater number from only 63 per cent. His remainder (excluding 4 per cent. too advanced to be treated by any method) can be treated by radium and a small number of cures obtained this way; whereas the radiologist has no such surplus, having used up his entire stock of available material in obtaining his results. The conclusion I drew was that at the present time the largest number of cures of carcinoma of the cervix were to be obtained by operating on the operable cases and treating the remainder by radium. I further showed that the advantage of surgery over radium lies in the former being able to cure a proportion of the cases whose regional glands are already cancerous by the time they seek advice, whereas in the case of radium all these patients are beyond its scope. The inability of the radiologist to distinguish beforehand the gland-involved from the gland-free cases presented to him is a great drawback, for it compels him to treat a number of patients not only uselessly but to the exclusion of the chance that surgery affords. The truth of the matter probably is that in certain cases surgery, and in others radium, would give the best chance of cure, each case being a law unto itself in this respect, but our investigatory methods are too coarse and imperfect to enable us to discriminate accurately.

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[1] Proc. Roy. Soc. Med. (Sect. Obst. and Gyn.), 1929, xxii., 53.

This is the position at present, but how long it will continue so remains to be seen, for the control of the forces of radio-activity is yet in its infancy and the future may see the power capable of disrupting the very atom into its component parts harnessed and directed to a degree only dreamed of to-day. We have, however, to deal with things as they are, not as they may be, and hence I deprecate as altogether premature the appeals that have been made to the younger generation of gynæcological surgeons not to embark on the operative treatment of cancer of the cervix, but instead to take up radium therapy, the present estimate of whose value in this connexion is founded solely on figures from abroad. Not until the results of reliable workers in this country are available shall we be in a position to properly appraise its effects, for it does not follow that the same measure of success attending a method of treatment in one country is necessarily attained when it is carried out in another country.

It has been objected against Wertheim's operation that its difficulty is such that only a few individuals are capable of performing it with success, but that is not the case. There is nothing in the operation that any surgeon of first-class aptitude cannot master, provided he will take the trouble to learn the technique from someone who has already mastered it. We hear a great deal nowadays about the necessity of radium treatment being confined to a relatively small number of experts in order that the best results shall be obtained, but no such demand has ever been made for surgical treatment, although the necessity was and *is ten times greater.*

The younger gynæcological surgeon of to-day does not start where I started, still less where Wertheim started. It is not now a matter of acquiring technical experience at the expense of his patients; the technique is already stereotyped, all he has to do is to serve an apprenticeship in it, follow it, and later on improve upon it. Nor is the extent of Wertheim's contribution to surgery only to be computed on the number of women cured of cancer as the result of it. The surgeon practising the operation is himself benefited, for besides arriving at a knowledge of the anatomy of the female pelvis obtainable in no other way, he gains a greatly increased confidence in the capabilities of his art and hence becomes a better exponent of it.

A Review

OF THE TREATMENT OF

INTRACTABLE DISCHARGE FROM THE NASAL SINUSES.

An Address delivered to Post-graduates at the Central London Throat, Nose and Ear Hospital on Jan. 24th, 1930,

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WHEN nasal discharge becomes intractable and does not yield either to Nature or to ordinary treatment it is necessary to review the case in order to discover the cause of the intractability; the common cold furnishes us with the most simple example of pathological change which affects the nasal mucous membrane. These changes may be divided into three.[1]

THREE STAGES IN PATHOLOGICAL CHANGE.

Stage 1.—At the beginning of a cold the nasal mucous membrane reacts to the infection by an increase of secretion from its mucous glands.[2] If in this stage the mucus is examined microscopically it will be seen to contain a quantity of micro-organisms, the mucus being, in fact, secreted with the object of destroying them. If it does not destroy them the pathological process passes to the second stage.

Stage 2.—In the second stage Nature has given up the attempt to kill the micro-organisms by means of mucus, the increasing toxins from these micro-organisms paralyse the secretion from the mucous glands, and the nose becomes for a short period dry. The micro-organisms, thus partially deprived of moisture, have difficulty in obtaining nourishment, but their toxins pass through the nasal mucous membrane into the blood stream and in the severer cases the reaction they call forth produces fever. This reaction also produces immunity in the blood stream to these toxins and, when immunity has been established, the temperature falls. The irritation of the mucous membrane by the micro-organisms has during this period produced an outpouring of serum and leucocytes which together tend to destroy the micro-organisms.

Stage 3.—The reactive stage. When the destruction of the micro-organisms has proceeded far enough for mucus to effect their final removal, the mucous glands begin to secrete again, and in this stage the discharge is generally very free. Microscopically this discharge consists of mucus often containing many leucocytes, generally containing desquamated epithelial cells and sometimes micro-organisms.

LEUCOCYTIC AND SEROUS TYPES OF COLD.

There are, I find, two types of cold, the leucocytic type in which the micro-organisms cause leucocytes to be attracted into the mucus where they ingest the *micro-organisms*; and the serous type in which the micro-organisms are of a different type in that they *do not cause* leucocytes to pass into the mucus, and are destroyed by immune bodies excreted in the serum.

These two groups appear to correspond with what is known regarding general immunity, for there are certain micro-organisms which produce immunity and for which antisera can be manufactured, while there are others for which sera cannot be prepared for they produce no immunity in the blood. We find these two main groups clearly demarcated in the two types of cold.

The common cold not infrequently becomes intractable by reason of excess of inflammation in the nose. The leucocytic type of cold when it becomes intractable does so on account of sinusitis and the main symptom which the patient suffers is that of pain. This is often severe and sometimes incapacitates. It may be necessary to have resource to treatment for this case, and of the various treatments which we have at our command, cocaine in 5 per cent. solution in saline stands first. We spray the nose with this and try to cause the mucous membrane to contract sufficiently to permit the contents of the sinus to be naturally discharged. If this is not successful, it will be necessary to wash out the sinus. Now I have one rule in connexion with the treatment of acute sinusitis which I think is of paramount importance—namely, that in no circumstances do I wash out an acute sinus with a watery solution. We can assess what happens when we do so by mixing the contents of such a sinus with saline. We find that micro-organisms previously retained within the leucocytes, or in the mucus and serum, are liberated. Nature has produced an antibacterial fluid in the sinus and if we dilute it, it loses many of its antibacterial properties and the washing out of such a sinus with a watery fluid is, I think, a dangerous practice. We can, however, aspirate the sinus through two catheters introduced within its lumen, or we may wash it out with oils, of which medicinal paraffin is by far the best.

The serous type of cold when it becomes intractable does so on account of desquamation of the epithelium and of toxic absorption. It is comparatively rare to meet with pain from sinusitis in this type of cold, although the sinuses may be infected, for the pain is generally of the toxic type which affects the back and joints. If we examine the discharge in the period of reaction we find that the mucus contains large quantities of desquamated cells. Before recovery can take place these cells will have to be replaced by the regrowth of the nasal epithelium, and until they are replaced toxic absorption in some degree can continue. The treatment of a case of this type is by oily douches. In no circumstances should watery douches be employed for they will spread infection to portions of the nasal mucous membrane in which the epithelium is becoming re-established, and thus prolong the cold and, moreover, will give rise to an increase in the degree of toxic absorption. Further, should the infected watery fluid pass through the Eustachian tube, the epithelium of this may desquamate, and the cilia being absent from the deeper epithelial layers, there is no method of removal of the micro-organisms which will spread along the tube and tend to cause acute otitis media.

PRODUCTION OF SINUSITIS.

Reference has been made to the two main types of cold, and it is clear that they may in many cases infect the nose synchronously. In such a case where leucocytic and serous reaction are present at the same time, neither of these reactions seems to be generated to its full extent, and recovery is delayed. This is the type of cold that produces sinusitis with toxic absorption and it is by far the most difficult cold to deal with. In this connexion we have to remember that in the early stages of a cold of this type the body has but little immunity to certain of the organisms. If it becomes necessary to open any sinus under such conditions, the veins within the bone are easily infected and a spreading osteitis may occur, sometimes with most disastrous consequences. In the treatment of a sinusitis complicating a cold, every effort should be made to avoid inflicting any trauma on the bone, and if it becomes necessary to open any sinus because we cannot pass a catheter within it, it is most essential that the opening of the bone should be made through an area in which large intra-osseous vessels are not present. Such areas exist in the lower wall of the frontal sinus[3] [4] [5] and far back on the naso-antral wall beneath the inferior turbinate.

Under suitable conditions a mild cold recovers by itself, or as a result of palliative treatment of the nasal mucous membrane. The results of palliative treatment may, however, easily be annulled if reinfection constantly occurs. Such reinfection may be air-borne or finger-borne. Air-borne infection may occur from other people's septic teeth as, for example, when a mother has pyorrhœa and constantly infects her child, or when a clerk has well-marked nasal or dental sepsis and infects the air around him. On the other hand, reinfection in children constantly occurs when they introduce their fingers into the nose. In a few cases patients will reinfect their nose after an antral operation by failure to sterilise the cannula which they employ for douching.

The nasal mucous membrane in the stage of recovery from a cold regrows the epithelium which has been desquamated during the active process, and also forms additional new mucous glands if the state of recovery is prolonged, and the presence of micro-organisms in the nose producing active inflammation tends to produce new fibrous tissue in the mucous membrane. Should the process of recovery be prolonged, one of these three factors will predominate. If mucous glands grow in excess we term the process hypertrophic rhinitis, though here the congestion may produce an actual increase of the periosteal bone so that the hypertrophy may be of bone and mucous membrane. If, on the other hand, fibrous tissue has been produced in great excess a fibrotic type of atrophy will follow. If the desquamation has been excessive, a crusting type of atrophy will be found and toxic absorption will be present in considerable degree with resultant manifestations in the joints,[5] or in the fibrous tissue around the periphera nerves. Deficiency of the blood-supply to the mucous membrane (such as occurs in the anæmias and in syphilis) will expedite this second type of atrophy.

We have not so far spoken of the olfactory area of the nose. This is the area above the middle turbinate, and here the secretions have a different nature in that they are watery so as to dissolve odiferous substances and thus permit them to stimulate the endings of the olfactory nerve. This area is one in which inflammation may be dangerous, for the olfactory nerves are sheathed by lymphatics which convey the lymph from the nose to the meninges.[6] Should an intractable rhinitis be present in this area, oily solutions should be employed, for these seem to prevent absorption of the toxins by these lymphatics.

CHRONIC INTRACTABLE SINUSITIS.

Theory of the "Master" Sinus.

In chronic sinusitis examination seems to prove that all the sinuses are equally infected. It is rare, however, that this is actually the case, for generally there is a master sinus which infects the others, and this sinus only is in a stage of inflammation from which it cannot recover without aid, while all the other sinuses will recover of their own accord if reinfection from the master sinus can be stopped. These cases of sinusitis differ very greatly in the amount of discharge which they emit. In some the discharge is slight in quantity. An X ray of such a case will generally show no alterations in the sinuses, but should we have the good fortune to examine such a case when it is recovering from a cold, the master sinus recovers less quickly than the others, and this alone will be dull upon the radiograph. In other cases where the sinusitis is of high degree the character of the secretion aspirated from the sinuses may indicate the master sinus, for in the master sinus micro-organisms may be seen free in the secretion, while in the other sinuses they are absent, or are contained within the leucocytes. The treatment will depend on the type of sinusitis we are dealing with, but in all types the same general rules of treatment will apply. These rules may be expressed as follows. We wash out each infected sinus and note if washing out produces an improvement. If on each washing out there is considerably less discharge this process is continued until cure results. Whether we should wash out with oil or with water will depend on the type of case with which we deal. If, on the other hand, washing out produces only temporary improvement, we either catheterise the sinus and tie in a catheter through which the patient washes out the sinus as an in-patient, twice a day, or, in the case of the antrum, we open the antro-nasal wall so as to permit the patient to pass a catheter twice a day and so wash out the sinus. The type of patient will, to some extent, determine whether we operate or no. In children one lavage will generally cure the case and this is best done under general anæsthesia, which will also give an opportunity to remove infected adenoids or tonsils. In nervous ladies, some small opening should be made, under general anæsthesia, such as will permit them to wash out the sinus. In other persons it is generally possible to do all that is required under local anæsthesia, although on the first occasion it may be wise to give gas in addition, for after the first puncture the instrument can be introduced into the sinus without discomfort under local anæsthesia alone.

Atrophic Sinusitis and Rhinitis.[7] [8]

If there is general crusting atrophy of the nasal mucous membrane, this is a contra-indication to the performance of all operations excepting those of urgency, for the devitalised tissues have but little power of recovery and general infection may quite readily ensue. Patients with the fibrous type of atrophy, on the other hand, stand intranasal operations well in the rare cases when surgical interference is required. As regards treatment of atrophic sinusitis and rhinitis, the fibrotic type as a rule requires an oily douche to guard the mucous membrane from undue evaporation; the crusting type requires much more active treatment in that the crusts must be removed by means of forceps, or if need be by hydrogen peroxide, after which it should be kept free from crusts and treated as if the condition were an eczema. Calamine lotion may give good results, but in some will cake into hard masses. Should this be the case ointments of calamine in a base of lard, or vaseline may be substituted, while sometimes ichthyol and glycerin give good results. In every case the master sinus must be sought and dealt with.

Radiography.—The atrophic type shows no dullness on the skiagram to which the bones are more readily transparent than in the normal, and the hypertrophic type is almost always accompanied by thickening of bone which thus casts denser shadows on the radiograph. The presence of bone which is very penetrable to X rays will make us consider the question of operation with especial care, for the reaction of the tissues except in the fibrous type is likely to be slight.

Microscopy.—If we examine the discharge under the microscope and see free micro-organisms in the fluid, we shall, as a rule, do well to postpone operation until, as a result of treatment, such a degree of recovery has taken place that free micro-organisms are absent from the discharge. If we cannot succeed in this our operation should be limited to the smallest removal of the bone that will permit the patient to wash out the sinus for himself.

Hypertrophic Sinusitis and Rhinitis.

If there is hypertrophy of the mucous membrane of the nasal air-way the resistance of the intranasal structures is high; an operation can be done with practically no risk whatever. There are certain cases of sinusitis in which the degree of hypertrophy is so great that we may feel certain that intranasal operation and douching out the sinus will not effect a cure. In such a case there may be polypi and these may be present in the antrum, where their presence may be demonstrated by a radiograph after an injection of a suspension of finely powdered bismuth oxycarbonate into the antrum. This method will also serve to show the existence of a carcinoma of the antrum. Lipiodol should be substituted for the bismuth in the sphenoid or the frontal sinus. If we find sinusitis of this hypertrophic type we should open the antrum from the outside and thus remove the polypi. If the polypi are in the frontal sinus it will be necessary to open this after the methods originally popularised by Howarth and by Kisch. It is rare to find polypi in the sphenoidal sinus but they are common in the ethmoid, and as they generally grow from bone which is devitalised and carious, it is in these cases necessary to exenterate the ethmoidal labyrinth.[9] In any intranasal operation the most gentle technique which is consistent with thoroughness will produce the quickest and most lasting cures.

FACTORS IN PRODUCTION.

Rôle of Dental Sepsis.—Abscesses at the root of the molar teeth will not infrequently infect the antrum. When they do so the sinusitis may be one of two types: either the abscess actually bursts into the antrum which undergoes rapid inflammation and becomes filled with fœtid pus, or the abscess causes periostitis beneath the antrum and the mucous membrane thus becomes inflamed. It is of paramount importance to deal with every form of dental sepsis complicating sinusitis and it will not be sufficient to examine the teeth superficially, for in several instances the dental sepsis has been revealed only by a skiagram.

In other cases pyorrhœa may produce general toxæmia, or may indirectly cause infection of the antra. In yet other cases the pyorrhœa may cause infection of the air around the patient, and he may infect not only other people but himself. A form of atrophic rhinitis from this cause is not unknown.

Rôle of Nasal Obstruction.—If nasal obstruction is present it may diminish the opening of the nasal sinus so that it affects the drainage of this into the nose. In such a case cocaine will generally free the opening temporarily and should be used in all acute conditions. It is, however, necessary to free the obstruction by some form of operation in cases of sinusitis which do not improve. Nasal obstruction may play another part in producing sinusitis in that the tortuous air-way which a deflected septum produces causes a considerable area of the mucous membrane to be out of the inspiratory air current, as a result of which the rôle of dust removal falls upon a similar area of mucous membrane which tends to become more easily inflamed. Sinusitis and rhinitis can then be produced with a less degree of infection than would cause the same condition were all the nasal mucous membrane presented to the air current in the normal manner.

ENVIRONMENT AFTER OPERATION.

We shall do well in treating sinusitis to consider the environment to which the patient will be going after operation. If he is going to a dusty climate, such as may be met with in certain portions of Australia or South Africa, every effort should be made to conserve as much as possible of the mucous membrane. If we remove the middle turbinate and portions of the inferior we shall not leave enough mucous membrane to deal with the environment of dust, and when a mucous membrane is subjected to more trauma than it can resist it will become atrophic, and this is the fate of many operations designed to give the best results in England when the patient moves into a dusty climate such as those which we have mentioned.

Disorders in the General Health.[10, 11]—It is not infrequent to find cases of intractable sinusitis which recover spontaneously on improvement of the general health, or in which success by local treatment or by surgery can only be obtained when the patient's general condition can be improved. In this connexion we have had to consider causes of toxæmia other than those emanating from the infected sinus. Such conditions may be met with in the bowel as a result of chronic constipation or appendicitis. In considering a case of sinusitis, therefore, it is necessary to avoid the errors which arise from considering only the region of the nose. Many a cold which showed signs of becoming a chronic sinusitis has been cured by a timely dose of castor oil. Many a case of chronic ill-health apparently due to sinusitis has been cured by dealing with the appendix or the gall-bladder. In older people the presence of chest conditions has frequently led to failure to recover from conditions in the nose, while cardiac conditions may not infrequently predispose to nasal inflammation. Active tubercle and syphilis must always be sought for in patients whose health is poorer than the clinical signs will warrant.

As regards the general state of toxæmia met with in certain of these patients, it would appear that liver diet, or the extract administered hypodermically, is extremely valuable in raising the resistance during treatment.

The condition of the skin is of considerable importance. There can be no doubt that persons with an acid skin stand operations badly, though whether this be by reason of a diminished elimination of certain poisons by the skin, or because they have some degree of acidosis, does not seem clear. Certain it is that the removal of all secretion from the skin by frequent washing is important in patients in whom the powers of resistance are diminished.

As regards acidosis, or rather the compensation for the acidosis, we meet with this condition so frequently in toxæmia, and it is so important as an agent in preventing the recovery of intractable sinusitis, that one feels that the compensated acidosis and the toxæmia must in some way be dependent on each other. Certain it is that if we give a patient a sufficient quantity of sodium bicarbonate to render the urine slightly alkaline, that immunity is often re-established where previously the patient suffered from toxæmia. It is good practice, therefore, to assess the degree of acidosis which is compensated and to remedy this during the period of treatment. The use of alkalis must not be long continued or phosphatic stones might possibly be formed within the hilus of the kidney or bladder.

As to the use of vaccines in these cases, they are sometimes very successful if given in a special way. The method that I advocate is as follows. A culture is made from pus *sucked from the interior of a sinus*, and a vaccine is prepared from it. A very small dose of vaccine is then injected into the superficial layers of the dermis, and not hypodermically. This forms a bleb upon the skin, and if the vaccine contains the toxins which are circulating a reaction similar to that of von Pirquet occurs. By the degree of reaction the appropriate dose of vaccine may be gauged. This is a matter of some importance, for an overdose of vaccine can debase immunity for a considerable period. When the appropriate dose has been discovered, vaccines may be given hypodermically with an occasional intradermic dose to estimate the degree of reaction to the vaccine. There are certain types of sinusitis and rhinitis in which violent and painful reactions of the nasal mucous membrane occur at quite irregular intervals, and during an attack the mucous membrane is vermilion red. These are probably cases of susceptibility to some air-borne vegetable or animal protein, together with the ordinary inflammation of a sinusitis. The mucous membrane in these conditions permits absorption very readily, and if a tiny but increasing dose of vaccine is sprayed into the nose the mucous membrane sometimes reacts to this and a local immunity may be thus established. In passing it may be mentioned that cases of this type are entirely unsuitable for any sort of operation other than simple lavage of the sinuses.

SUGGESTED LINES OF TREATMENT.

If the condition is one of atrophy with crusting in the nose and often with offensive smell, the following line of treatment will often give most excellent results. The nose should first be cleansed of crusts and discharge with hydrogen peroxide and if necessary the crusts should be removed with forceps. When it is clean it may be packed with gauze, soaked in the following solution and this retained in the nose for 24 hours.

R	Iodoform	grs. 30.
	Bismuth subnit. ..	grs. 60.
	Paraffin liq. ..	ad oz. 1.

After removal the nose is cleansed twice daily, first by douching with saline, then with

℞	Hydrogen peroxide ..	vols. 20, oz. 1.
	Normal saline ..	ad oz. 10.

This should be warm and the strength of the peroxide should be increased until slight stinging follows its application. The nose should then be vigorously blown and the following solution swabbed into the nose with wool:—

℞	Calamine	grs. 60.
	Glycerin	dr. 1.
	Aqua	ad oz. 1.

This treatment, which is based on treating nasal atrophy as if the condition were one of eczema, gives good results only in so far as it removes the greater portion of the inflammation from the portion of the nose which lies within the nasal air-way. It does not however reach the sinuses, and if, as generally, these are affected they must be washed out. Saline may first be used for this but if it fails, as commonly, to stop discharge, a 1 per cent. solution of argyrol may be tried. A weak solution of iodine made by adding a drachm of the French tincture to a pint of saline may be used instead of the argyrol, and alcohol may be usefully added to this if the discharge from the sinus does not cease. My own belief is that we should never operate upon a case of atrophic rhinitis unless forced to do so by some urgent and acute complication, which is fortunately very rare. If the sinus condition does not clear up with treatment it is, I think, good practice to use formalin vapour as a means of treatment. The use of this is based upon the fact that workers in trades in which formalin is used do not catch colds and often lose their nasal infection when they start employment of this nature. We can copy this by placing a little 1 per cent. formalin in the patient's bedroom and allowing it to work *while he sleeps, having first assured ourselves that* the patient during the hours of sleep breathes through his nose. The formalin should never be so strong as to make the eyes water. Many cases will clear up when dealt with by this means, though some are irritated.

There is one type of atrophy which deserves special mention—namely, the type which follows operation and affects small areas of the nose and proves intractable to treatment. The atrophy here is incomplete and can as a rule quite readily be cured by application of a dull heated actual cautery. The most that we can do with any case of atrophy is to produce a functionless and fibrous type of mucous membrane. Discharge upon this membrane is extremely small in quantity but tends to dry and to form crusts. Such patients should therefore be provided with an oily douche such as the following:—

℞	Ol. pini	♏ xxx.
	Paraffin liq. ..	ad oz. i.

This should be instilled daily into the nose with a medicine dropper; sprays do not yield sufficient oil to serve the needs of such a mucous membrane.

In acute cases a masterly inactivity gives the best results provided that we raise the general resistance. It is good practice to combat the acidosis by means of alkalis or fruit juice, for the temperature frequently falls and the local condition improves directly the urine has become alkaline. If this fails we may douche the nose with oils such as liquid paraffin, but never with a watery solution. If there is reason to believe that pus is retained within a sinus we should contract the mucous membrane with cocaine and try to cause the pus to escape. If this fails I personally try to introduce soft catheters into the frontal or the sphenoid sinus. These are stiffened with wire which is withdrawn when the catheter is in position. The sinus is then douched with oil and generally clears up.

If there is an empyema of the maxillary antrum this should be washed out by making a very tiny opening well back in the nose beneath the inferior turbinate. Oil should be used for washing out. If the antrum is infected by a carious tooth this should on no account be removed during the acute stages of the inflammation lest sepsis spread to the diploë of the alveolus.

Cases in which an acute sinus condition has complicated influenza must be watched for some time afterwards with considerable care, lest an intractable rhinitis manifests itself later.

Hypertrophic Rhinitis.—In this condition we have evidence that the mucous membrane has reacted to the infection. We have two types of this complaint, the infected and the uninfected. In the infected type we can find free micro-organisms in the discharge, or micro-organisms in the leucocytes. These cases show for the most part intermittent symptoms. They should be treated with respect. The master sinus should be found and carefully washed out. If the discharge becomes less each time the washing out will cure the case. If the discharge does not decrease with the washing out, we shall have to wash out more frequently and, therefore, must perform an operation in order to permit the patient to do this for himself. This is the reason of opening the antrum in the majority of cases. The frontal sinus and the sphenoid demand severe operations to remedy discharge within them. Every effort should therefore be made to clear up this discharge by palliative measures. Similar remarks apply also to the ethmoids. We should always bear in mind the possibility that a dental sepsis is keeping up discharge.

Non-infected Type.—In this the mucous membrane has killed the micro-organisms and continues to discharge mucus from the glands which have been produced in extra numbers during the period of inflammation. These simple uninfected cases are readily diagnosable by the microscope, for the mucus contains no micro-organisms and few, if any, leucocytes. A simple nasal douche will in course of time cause the discharge to disappear.

Obstructive Type.—The nasal air-way may be obstructed on one or on both sides. The tortuous characters of the abnormal passages will throw the work of removal of micro-organisms on to a very small area of the mucous membrane. This may become inflamed and inflammation may readily spread to sinuses. This will not then get well unless the cause of this same inflammation is removed and the tortuosity of the abnormal passages removed by resection of the septum and by moulding the turbinates into more normal positions, removing such portions of them as are greater than will be required.

REFERENCES.

1. Benians, T. H. C.: Brit. Med. Jour., 1920, i., 668.
2. Yates, Lowndes: Jour. Laryng., 1924, xxxix., 554.
3. Howarth, W. G.: Ibid., 1921, xxxvi., 417.
4. Harmer, W. D.: Carson's Surgery, 1924, ii., 265.
5. Kisch, H.: Proc. Roy. Soc. Med., 1926, xx., 4 and 72.
6. Clark, W. E. le Gros: Reports on Public Health and Medical Subjects, No. 54.
7. Mollison, W. M.: Proc. Roy. Soc. Med. (Sec. Laryng.), 1926, p. 33.
8. Benians, T. H. C., and Hayton, C. H.: Jour. of Laryng., 1919, xxxiv., 325.
9. Skillern, Ross: Brit. Med. Jour., 1928, ii., 562.
10. Watson-Williams, P.: Semon Lecture, Jour. of Laryng. and Otol., 1925, xl., 765.
11. Willcox, W. H.: Proc. Roy. Soc. Med. (Sec. Laryng.), 1926, p. 49.

ALKALOSIS IN CONGENITAL HYPERTROPHIC PYLORIC STENOSIS.

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THE occurrence of alkalæmia in gastric and intestinal obstruction has been recognised for a decade. A summary of the literature appears in a contribution by Hartmann and Smyth,[1] and these authors submit a series of blood and urine analyses in cases of intestinal obstruction in part of the alimentary canal. Ten cases of their series were suffering from congenital hypertrophic pyloric stenosis and, of these, eight had a raised bicarbonate reserve in the blood. In view, on the one hand, of these results, and, on the other, of the commonly held view that acidosis is to be expected in this malady, it was decided to investigate all the cases of congenital pyloric stenosis occurring in the wards of the Hospital for Sick Children and the Infants Hospital from the point of view of blood reaction and salt content, and associated changes in the urine.

Methods.—The hydrogen-ion concentration of the blood was investigated by the method of Martin and Lepper[2] and the plasma bicarbonate by that of Stillman, Cullen, and Slyke modified (W. W. Payne). Blood is obtained from a puncture of the finger, ear, heel, or great toe, and allowed to flow under liquid paraffin in a tube of the type described by Martin and Lepper.[3] Potassium oxalate or heparin is used to prevent clotting, and about 0·5 to 1 c.cm. of blood can usually be obtained from one puncture without much difficulty. The blood is mixed by rotating the tube through its long axis, and is then centrifuged. The top of the collecting tube is removed and 0·1 c.cm. of plasma is pipetted into a cordite tube two inches in length. The pipette is washed out twice with 0·1 c.cm. of neutral normal saline and the washings added to the cordite tube; 0·5 c.cm. of HCl (N/100) is then added. This stage of the procedure should be completed as quickly as possible owing to the possibility of glycolysis, which may cause a low result. Subsequent manipulations may be delayed for several hours *without any alteration in the results.*

The carbon dioxide liberated by the hydrochloric acid is removed by shaking the cordite tube for three minutes under reduced pressure. This may be done by applying to the mouth of the cordite tube a rubber cork pierced by a glass tube attached to a water pump. Next are added 1·8 c.cm. of neutral normal saline and 0·15 c.cm. of phenol red solution (0·02 per cent.), and the mixture is titrated with caustic soda—N/50 (carbon-dioxide free)—to pH 7·6, using a micrometer syringe (Trevan [4]).

Before the actual titration of the plasma is commenced, the acid itself must be standardised. For this, 0·5 c.cm. HCl (N/100), 2 c.cm. of the saline and 0·15 c.cm. of the phenol red solution are placed in a cordite tube and titrated to pH 7·6. This titration must be repeated until constant values are obtained.

In calculating the results, the difference between the titration values of the HCl alone and HCl + plasma expressed as c.cm. of N/50 NaOH, is multiplied by 0·2. This gives the molar concentration of bicarbonate.

The blood chloride was estimated by the method of Claudius (somewhat modified)[5]; the urea according to Twort and Archer[6]; the hydrogen-ion concentration of the urine colorimetrically, and the urine chloride by Volhard's method, or as for blood.

The figures for normal infants are as follows: pH 7·35–7·42; plasma bicarbonate: 0·022–0·028 molar; plasma chloride: 0·096–0·106 molar; blood-urea: 0·015–0·04 per cent.

Results in Congenital Hypertrophic Pyloric Stenosis.

Of 34 cases of congenital pyloric stenosis, 28 had an increased bicarbonate reserve at some period before operation. In no uncomplicated case was acidosis present. On admission the plasma bicarbonate was found to be above 0·04 molar in 10 of the 34 cases. The pH of the blood before operation was usually increased, though not to the extent that might have been expected from the bicarbonate level. The chlorides, in general, varied inversely as the bicarbonate. The sum of chloride and bicarbonate molarities was reduced, cases with marked alkalosis showing as a rule the greatest reduction and cases with moderate alkalosis a slight reduction. It will be noted, however, that the total molarity was lower in cases with a normal bicarbonate reserve than in those with slight alkalosis. These findings are illustrated in Table I.

TABLE I.

HCO_3 molar.	pH mean.	Observations.	Cl molar mean.	Observations.	HCO_3 – Cl mean.	Observations.
–0·03	7·41	3	0·095	9	0·120	9
0·03–0·036	7·42	9	0·090	9	0·122	9
0·035–0·04	7·46	7	0·081	12	0·119	12
0·040 –	7·47	10	0·075	16	0·118	16

Examination of individual cases shows that the sum of Cl and HCO_3 molarities may be high, normal, or low. It was high in two cases, normal in six, and low in 21. Copious doses of normal saline were given to all the cases. In only seven of these have more than one pre-operation record been made. Four cases show a rise of plasma chloride, but two show a definite fall in chloride, in spite of the subcutaneous salines.

Blood-urea.—It will be seen from Table II. that the association of blood-urea with total molarity, or with plasma bicarbonate alone, is not close. This accords with the findings of Graham and Morris.[7] The post-operative changes in the blood must be *correlated with the appearance of subsequent vomiting.* In cases without vomiting or toxæmia the plasma bicarbonate became normal in from two to four days, but in the other cases the return was delayed for a week or more. In five cases the blood-urea was estimated before and shortly after operation. In all these an increase followed the administration of an anæsthetic. The increase in one case may be due partly to an intestinal infection.

TABLE II.

HCO_3 +Cl.	HCO_3 molar.	Urea per cent.	HCO_3 +Cl.	HCO_3 molar.	Urea per cent.
0·097	0·0431	0·032	0·118	0·0367	0·033
0·101	0·0397	0·149	0·118	0·0317	0·030
0·109	0·0340	0·045	0·119	0·0438	0·022
0·111	0·0440	0·050	0·119	0·0418	0·072
0·112	0·0411	0·039	0·122	0·0373	0·022
0·113	0·0317	0·030	0·122	0·0201	0·033
0·116	0·0290	0·064	0·123	0·0413	0·076
0·117	0·0437	0·050	0·130	0·0460	0·043
0·117	0·0410	0·017	—	—	—

Urine.—When the plasma bicarbonate was raised, the urine was found to be alkaline, with the exception of five cases. Before treatment chloride was absent from the urine, or present in traces only, in all except two cases, and this was true even of those cases where the plasma chloride was normal. Acetonuria was found only three times in 21 observations before operation. Therefore acidosis is absent from cases of congenital pyloric stenosis, and ketosis is rarely found. It was not always possible to gauge the level of alkalosis from the appearance of the patient. While pallor and drowsiness were common, and were suggestive of alkalosis, two of the worst cases in the present series appeared quite lively and of good colour.

Discussion.

The blood normally contains large quantities of chloride of sodium and other bases. When the acid gastric secretion occurs, chlorine ions leave the blood and an excess of base is left; this combines with CO_2, increasing the bicarbonate reserve of the blood. As the gastric contents pass into the small intestine, considerable reabsorption of chloride occurs, and the base chloride content of the blood is restored. When the pylorus is obstructed and vomiting occurs, the continued loss of HCl in the vomitus leads to a depletion of chlorine ions in the blood, and the base originally combined with them now combines with CO_2 to form bicarbonate. This relative excess of base bicarbonate is excreted to a variable extent by the kidney and the urine becomes alkaline. On the other hand, the low chloride level of the plasma leads to a retention of chloride by the kidney and the *urine tends to become chloride-free. If the vomiting* persists, loss of acid in the vomit and of corresponding base in the urine will lead to a diminution of the total amount of base chloride in the body. Further, the gastric secretion contains not only HCl but also sodium chloride, and the loss of sodium chloride directly in the vomit is added to the salt loss arising from the loss of HCl alone. This salt loss cannot be replaced from the salts of the food, because vomiting prevents their absorption.

Although the total salt content of the body is diminished, it does not follow that the salt content of the blood per cubic centimetre is lowered. This will depend on the loss of water relative to the loss of salt. There are three possibilities: (1) The loss of water is relatively greater than the loss of salt: (2) the loss of water is proportional to the loss of salt—i.e., the fluids excreted by the stomach and kidney are together isotonic; (3) the loss of water is relatively less than the salt loss. Under these circumstances the osmotic pressure of the blood will be diminished. Compensatory mechanisms are then brought into play, which have as their object the maintenance of the osmotic pressure by retention of substances normally excreted by the kidney. *It has already been seen that in alkalosis the* excess of plasma bicarbonate is excreted in the urine, but when the alkalosis is associated with a low osmotic pressure the excretion of this excess of alkali tends to lower the osmotic pressure still more. There are thus two abnormal conditions present, and that mechanism which helps to minimise one abnormality *is bound to accentuate the other: excess of base in* the blood requires the excretion of basic salts by the kidney, while lowered osmotic pressure calls for the retention of all salts, basic and otherwise. According to Hartmann and Smyth,[1] osmotic requirements are the more important, and base is retained by the kidneys, with an even greater increase in the plasma bicarbonate. *In such circumstances, however, the* acid products of metabolism still require to be removed, and they are excreted in the urine as such or in combination with ammonia. Therefore, in cases of pyloric stenosis when the osmotic pressure falls to a certain level, one would expect to find a further increase in the bicarbonate reserve of the blood and a change in the urinary reaction from alkaline to acid. Such findings are recorded in certain of Hartmann's cases, but in the present series they were exceptional. Thus, the sum of HCO_3 and Cl molarities was low in three cases and extremely low in four others, but in all these the urine was alkaline, while acid urines were associated with alkalosis in four cases, although the sum of HCO_3 and Cl molarities was only slightly below the normal figure.

Another possible means of maintaining the osmotic pressure of the blood is afforded by a retention of urea in the kidneys. Certainly, the blood-urea is often raised in congenital pyloric stenosis, but it has been noticed previously that the blood-urea does not bear a close relation to the sum of HCO_3 and chloride molarities. It is probable that both urea retention and base retention (with the excretion of an acid urine) depend on some factor in addition to the osmotic pressure of the plasma; possibly to deficient renal excretion. Thus, the loss of water from constant vomiting leads to profound dehydration and deficient circulation through the kidneys: this, in turn, might quite easily result in imperfect excretion of base (cf. Henderson and Palmer[8]) and of urea.

Reaction of the Blood.—The relatively small rise in pH associated with increase of the plasma bicarbonate must be explained by retention of CO_2. It is noteworthy that Graham and Morris[7] have observed that the respiratory exchange is diminished in these cases. This retention of CO_2 doubtless explains the infrequency of tetany in congenital pyloric stenosis.

Treatment.

Apart from the usual treatment with drugs and lavage it is necessary to administer large quantities *of fluid because of the dehydration. As alkalæmia* is present as well, no bicarbonate of soda should be given. It is probable that sudden death before and shortly after operation may be the result of alkalæmia, and this is more likely to occur if alkalis are being given therapeutically. Sodium chloride, on the other hand, is indicated, because it helps to limit the fall of chloride and rise of bicarbonate, and so tends to maintain the osmotic pressure of the blood. Indeed, copious saline infusions often bring about a striking improvement in the physical condition before operation, even in cases which at first sight appear quite hopeless. Probably it is worth while to delay operation in every case until about a pint of normal saline has been administered. If, however, it is not possible to introduce sufficient fluid, hypertonic saline (2 per cent.) may be used. Glucose may be combined with the saline, although this is not essential because of the rarity of post-operative ketosis.

following way. The blood-vessels of the blood-forming tissues are composed of histocytes (reticulo-endothelium) and the leucopoietic process occurs on the outer aspects of their boundaries. Piney says:

> "it may well be supposed that any injury to the vascular wall will permit immature leucocytes to escape into the lumen and so reach the general circulation."

This may be the initial lesion following the trauma, after which it is not hard to imagine that a compensatory productivity of the reticulo-endothelium becomes excessive and the process advances throughout the system. There is abounding evidence of the neoplastic nature of leukæmia, which is only one of the many existing types of malignant disease of the hæmatopoietic system—myeloma, chloroma, and (?) lymphadenoma.

All the cases of leukæmia following trauma have been of the myeloid variety; there is no evidence of a lymphocytic leukæmia or of an erythræmia beginning in the same way through proliferation of the corresponding type of cell. The explanation in the former case may be that the specific portions of the non-granular formative tissue are not strategically situated for that type of stimulus, and in the latter case that the red-blood forming tissue is not so susceptible to abnormal stimulation as is the white (granular) blood forming tissue.

Obviously, trauma cannot be regarded as the cause of all myeloid hyperplasia, and even in those cases where it is causative it is probably not wholly responsible. Traumata to susceptible regions occur every day and no one can avoid them, and yet such cases as are recorded here are remarkably rare. Some other factor must be at work and in all probability it occurs as a susceptibility to the disease, a predisposition or diathesis. It is only the predisposed who get the disease, just as only the predisposed have a sarcoma at the site of a former injury. Addison's anæmia has been shown to be due to an inherent abnormality which may be brought out in one of many ways; leukæmia can be placed in a similar class. Without the precipitating influence of trauma or some other influence, such as malaria or syphilis, the disease may or may not develop in the predisposed person. There is some evidence that this susceptibility may be inherited or it may merely be congenital. Piney writes: "it is probably rare for a congenital anomaly of the hæmatopoietic tissue to be so extreme as to result in manifest disease without the interposition of some further stimulus. Such environmental changes may be internal or external."

Finally, reference must be made to the medico-legal aspect of this type of case. In the German series a note about compensation was found in four cases. Three of the cases were awarded pensions on the assumption that the trauma received at work was responsible for the consequent illness. The fourth case was refused compensation. Compensation was refused by the courts in the present case.

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Bibliography.

Allbutt, C., and Rolleston, H. D.: System of Medicine, London, 1909, v., 806.
Christian, H. A.: Oxford Medicine, New York, 1927, ii., 691.
Chapelle, de: See Schattman.
Ebstein, W.: See Schimert.
Gowers, W. R.: System of Medicine (J. R. Reynolds), London, 1879, v., 226.
Grawitz: See Schimert.
Gulland, G. L., and Goodall, A.: The Blood, Edinburgh, 1925, p. 214.
Herman, E.: See Schimert.
Hermani, F.: See Schimert.
Heschl: See Schattman.
Hindenburg: See Schattman.
Kaltenschnee, K.: Leukæmia und Pseudoleukæmia nach Trauma, Jena, 1911.
Klemperer: See Schattman.

(*Continued at foot of next column.*)

(*Bibliography continued from previous column.*)

Knoth, R.: See Schimert.
Koschin, L. M.: See Schattman.
Kutschera, A.: See Kaltenschnee.
Leuders: See Schimert.
Liniger: Monats. f. Unfallheilk., 1912, xix., 57.
Martinelli, M.: Policlinico, 1925, xxxii., 1239.
Minot, G. R., and Buckman, T. E.: Amer. Jour. Med. Sci., 1923, clxvi., 469.
Minot, G. R., and Lee, R. J.: Nelson Living Medicine, New York, 1927, iv., 68.
Mosler: See Schimert.
Mursick: See Liniger.
Neuman, R.: Monats. f. Unfallheilk., 1911, xviii., 335.
Osler, W., and McCrae, T.: Principles and Practice of Medicine, London, 1925, p. 755.
Piney, A.: Recent Advances in Hæmatology, London, 1927, p. 37.
Ponfick: See Schimert.
Schattman, W.: Trauma und Leukæmia, Magdeburg, 1906.
Schimert, G.: Über Leukæmia nach Traumen, Griefswald, 1907.
Schimmel: See Kaltenschnee.
Schmidt: See Schattman.
Stempel, W.: See Liniger.
Stevens, A. A.: Practice of Medicine, London, 1926, p. 857.
Thiem: See Kaltenschnee.
Thomsen, G.: See Schimert.
Westphal: See Schimert.

SOME FURTHER NOTES ON THE RELATION OF CAROTENE TO VITAMIN A.

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IT has been found by J. C. Drummond and co-workers [1] [2] that the yellow pigment carotene, even when crude, is not a very active source of vitamin A, and more recently it is claimed that with increasing purification biological activity is progressively lost.[3] On the other hand, H. von Euler, P. Karrer, and co-workers, [4] [5] T. Moore,[6] [7] and the present writers [8] have found carotene to be a very active source of vitamin A, in which the activity increases with increasing purification. None of these workers has been able to divorce the biological activity from the pigment while the latter remained intact. Notwithstanding this failure the possibility still remains that the pigment and the substance responsible for the biological activity, in material derived from plants, are distinct substances, so closely resembling one another as to defy separation by the methods as yet tried.

In discussing the remarkably divergent results summarised above, it was suggested both by ourselves [8] and by Moore [9] that the exclusion by Drummond of fat from the basal diet of the experimental rats might be a significant factor in contributing to the negative result obtained by him and his colleagues. Those workers who had found carotene active as a source of vitamin A had always included fat in the diet. We have, therefore, sought to compare the effect of administering purified carotene, as the sole source of vitamin A, to groups of rats on diets devoid of and containing fat.

In the upshot, the presence or absence of fat in the diet was not found to have significance, but the solvent employed, in order to avoid the use of a natural fat as flux, was found to have a most important influence.

Administration of Carotene to Rats on Diets Containing and not Containing Fat, but Equally Deficient in Vitamin A.

Six young black and white rats of about 40 g. weight were used for the experiment and were divided into two groups. Each group contained one rat belonging to one litter and two rats belonging to a second litter.

During the preliminary depletion period of the experiment all the rats received the following diet:—

Casein *	20	Marmite	4
Rice starch	72	Salt mixture * ..	4

Water was added to make a paste.

* British Drug Houses. "Fat and vitamin free."

Each rat also received daily one drop of ethyl oleate, containing 0·004 mg. of irradiated ergosterol, as source of vitamin D. The animals were kept in cages on fine wire screens. On this diet the rats grew poorly and were only slowly depleted of vitamin A.

On the sixtieth day in the case of one rat, and on the forty-ninth in the case of the other two, in one group, 16 parts of starch in the diet were replaced by 16 parts of hardened arachis oil. At the same time it was apparent that other modifications in the diet of both groups were necessary. The rats were seen to be failing for lack of vitamin B and were only saved by administration of a dose of dried yeast and by subsequently raising the amount of marmite from 4 parts to 15. So small an amount of marmite as 4 per cent. is certainly not reliable as a sufficient source of B-vitamins, although it is that commonly used by some workers. At the same time, in consequence of observations described later, the solvent for the irradiated ergosterol was changed from ethyl oleate to liquid paraffin.

When both groups of rats were becoming depleted of vitamin A, the carotene was administered daily in liquid paraffin; the daily dose per rat was 0·006 mg. For the first 22 days of administration the carotene was derived from spinach; when this material was used up, another batch derived from carrot was used; the latter was known from other tests to be of about the same biological value as the former and was used for the last 17 days of experiment. The carotene maintained its colour fairly well in the solvent though slow fading was apparent, but the dose of carotene selected, 0·006 mg., was chosen as being well above the known minimal dose (0·003 and 0·002 mg. respectively) for the two specimens of carotene used. There was thus a margin to allow for a gradual loss of potency and for a possibly only partial utilisation of the carotene from the solvent.

The two groups of rats were equally maintained in health throughout the 39 days of experiment; those which received fat in the diet actually grew slightly less than those which did not. It is thus shown that the utilisation of the carotene as a source of vitamin A was not dependent on the presence of fat in the diet. The details of the experiment are set out in the Table.

Growth of Rats on Diets Deficient in Vitamin A, to which 0·006 mg. daily of Carotene is added, as Source of Vitamin A, after a Preliminary Depletion Period.

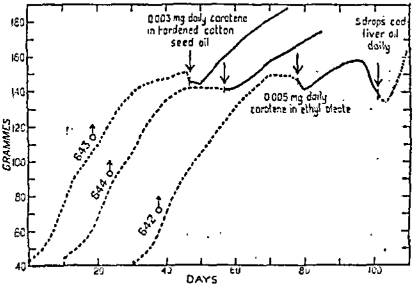
GROUP I.—Diet Devoid of Fat. II.—Diet Containing Fat.

Nature of diet.	No. of		Sex	Day of experiment on which carotene feeding—		Carotene feeding.	
	Rat.	Litter.		Began	Ended	Duration in days.	Growth during period (gms.).
I.	629	1441	F.	68	107	39	27
	648	1465	M.	56	95	39	28
	649	1465	M.	55	91	39	36
II.	630	1441	F.	68	107	39	18
	647	1465	M.	56	95	39	20
	651	1465	M.	55	94	39	24

Behaviour of Carotene in Different Solvents.

The use of a natural oil as a solvent for the administration of vitamin A in biological tests has been strongly condemned by Drummond,[3] who recommends ethyl oleate as a suitable solvent.[2,3] We have always used hardened cotton-seed oil as the solvent in our tests on carotene and have found it very satisfactory; there is probably a very slow decolorisation of the carotene, even in this solvent. In view of the discrepant results already referred to, it seemed desirable to make use of ethyl oleate as a solvent and to examine the behaviour of carotene in it.

The biological technique used was that usually employed by us;[6] the diet included hardened cotton-seed oil and sufficient dried yeast to supply at least one gramme daily, even to rats consuming the minimum amount of food. The carotene was dissolved in ethyl oleate and the solution was kept in a corked bottle in the cold room when not in use. It was found that in these conditions the carotene was comparatively rapidly decolorised. Thirteen days after the solution had been made up the loss of colour was quite convincing and no positive biological result was obtained with carotene dissolved in ethyl oleate. The weight curves of rats set out in the accompanying chart have been selected to show a comparison between the behaviour of the same sample of carotene dissolved in ethyl oleate and in hardened cotton-seed oil, as a source of vitamin A. Rats 642 and 643 were males of the same litter; rat 644 was a male belonging to another litter. Rats 643 and 644, after being first depleted, received a daily dose of 0·003 mg. of carotene (melting point 172° uncorr.), derived from spinach and dissolved in hardened cotton-seed oil. Rat 642 received a larger dose, 0·005 mg., of the same carotene freshly dissolved at the beginning of dosage in ethyl oleate. From the chart it is seen that the two rats receiving the smaller dose of carotene, but dissolved in hardened cotton-seed oil survived the 28 days of the experimental period and grew well throughout. The rat which received the larger dose of carotene, but dissolved in ethyl oleate, grew a little for the first 17 days of the experiment, but then began to decline. When the loss in weight had amounted to 20 g. it was treated with cod-liver oil and recovered, showing that the failure had been due to a deficiency of vitamin A and to no extraneous cause. At the time when this rat began to decline in weight the carotene solution in ethyl oleate had passed from a deep orange to a light canary yellow.



Weight curves of rats on a diet deficient in vitamin A. After depletion period, treated with carotene, dissolved in either ethyl oleate or hardened cotton-seed oil.

The effect of various solvents in producing oxidation of carotene was therefore compared, the diminution in colour of the solution being taken as evidence of the progress of oxidation. Oleic acid (Kahlbaum), redistilled ethyl oleate, olive oil, and paraffin were chosen and 2·5 mg. of the pigment were dissolved in 2·5 c.cm. of each of these solvents and kept in open tubes. Solutions of potassium bichromate were made up matching in intensity of colour each of the solutions and were kept as standards for comparison. The paraffin solution was somewhat paler in tint than the three other solutions. A similar set of solutions was made up in tubes which were then evacuated and sealed. In another experiment after being evacuated the tubes were filled with nitrogen before being sealed. All the tubes were kept at room temperature.

The colour of the solution of carotene in oleic acid fell off rapidly in the tube open to the air and at the end of a week the solution was completely decolorised, while in the same period the colour of the ethyl oleate solution had diminished considerably in intensity, and before the end of four weeks the colour had completely disappeared. The solutions, both in paraffin and in olive oil, remained for several weeks without apparent change and then a slow falling off took place. After three months a solution of carotene in olive oil, which had been exposed to the air, was still yellow.

The contents of the tubes sealed after the removal of oxygen showed a rapid falling off in the intensity of the colour in the oleic acid and ethyl oleate solutions, after which the colour remained for a long time without further change. The initial fading is most probably due to the incomplete removal of all oxygen from the tubes. All the three solvents, oleic acid, ethyl oleate, and olive oil, contain the oleyl radicle; it is possible that the oxidising action may be due to the presence of a small amount of linolenic acid, which forms very readily a peroxide, by means of which oxygen would be rapidly passed on to any substance dissolved in it. This oxidising action is somewhat less in ethyl oleate and very much retarded in olive oil. There is, however, no evidence that the olive oil contains less linolenic acid than does the purified oleic acid or ethyl oleate. Possibly the determining factor is the degree of solubility of oxygen in the different solvents. The addition of hydroquinone (1 part in 100,000) diminished but did not prevent the oxidation of the carotene, both in oleic acid and in ethyl oleate solution.

Whether the oleic acid and ethyl oleate are to be regarded as acting as pro-oxidants, or the olive oil as acting as or containing an anti-oxidant, it is clear that the use of either of the two former solvents is quite unjustified when dealing with a substance as susceptible to oxidation as is the highly unsaturated substance carotene.

Conclusions.

The presence or absence of fat from the basal diet does not appear to be a factor of any importance in determining the biological activity of carotene.

The unsuitability of ethyl oleate as a solvent for carotene affords a sufficient explanation of the discrepancy between Prof. Drummond's results and those of other workers on the activity of carotene as a source of vitamin A. Whether this fact supplies the whole explanation it is not yet possible to say. So far as our experience goes there is at present no evidence available finally to decide the relationship between carotene and the substance responsible for the biological activity in vitamin A of liver extracts. It cannot yet be decided whether carotene acts as a provitamin, as Moore[10] has suggested, or whether carotene from all sources is always accompanied by a constant percentage of impurity, which up to the present has defied all methods to separate it.

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Bibliography.

1. Drummond, J. C., Channon, H. J., and Coward, K. H.: Biochem. Jour., 1925, xix., 1047.
2. Duliere, W. L., Morton, R. A., and Drummond: Chem. and Ind., 1929, xlviii., 518.
3. Duliere, Morton, and Drummond: Ibid., p. 316T.
4. Euler, B. von, Euler, H. von, and Hellström, H.: Biochem. Zeit., 1928, cciii., 370.
5. Euler, B. and H., and Karrer, P.: Helv. Chim. Act., 1929, xii., 278.
6. Moore, T.: THE LANCET, 1929, i., 499.
7. Moore, T.: Biochem. Jour., 1929, xxiii., 803.
8. Collison, D. L., Hume, E. M., Smedley-Maclean, I., and Smith, H. H.: Ibid., p. 634.
9. Hume and Smith: Ibid., 1928, xxii., 504.
10. Moore: THE LANCET, 1929, ii., 380.

LIVER THERAPY IN ANÆMIA OF ALIMENTARY ORIGIN.

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IT is a well-established clinical fact that the anæmia resulting from cancer of the stomach does, in a certain small percentage of cases, resemble Addisonian anæmia. Text-books on medicine always include the differential features between these two conditions, and indeed without complete investigations it is sometimes impossible to arrive at a diagnosis. Gastric symptoms may be completely in abeyance, and the anæmia may dominate the clinical picture. The lemon-tinted skin, the anæmia, its symptoms and signs, with anorexia and flatulence, form a small but well-known clinical group of gastric cancer. While this possibility has been and is fully realised, the cause of such an anæmia has remained unexplained. Occasionally it has been attributed to the presence of secondaries in the bone-marrow, an explanation which has been found wanting in the majority of cases when they have been examined after death. Although hæmorrhage from the tumour site does occur and may be brought forward as a possible explanation of the anæmia, cases of marked anæmia are seen in which no bleeding can be demonstrated. While, therefore, the true cause of the anæmia has not been adequately explained, the advent of liver therapy, with its beneficial effect on primary anæmia, has renewed an interest in the relationship of these anæmias of alimentary origin to that of primary type.

Previous Observations.

Interesting observations have been recorded on some cases of gastrectomy for carcinoma, in which an anæmia has developed many years after the resection of the stomach and the autopsy showed no evidence of secondary growths, and no apparent cause for the anæmia. The oft-quoted examples are those of Moynihan[1] and Hartman.[2] While Moynihan's diagnosis was only clinical, Hartman's case showed a blood picture that resembled that of pernicious anæmia. The appearance of this type of anæmia following gastrectomy is, of course, rare and exceptional, for many surgeons have reviewed their series of gastrectomy and found no evidence of a primary anæmia, although a certain proportion of cases do show an anæmia of the secondary type. It is difficult to draw any conclusions from surgical cases, for gastrectomy is only a relative term, and in the majority does not mean total excision of the stomach—a procedure comparatively uncommon.

Dennig[3] reported quite recently the history of a man who had a gastrectomy performed on him in 1918 for a gastric ulcer who eight years later complained of paræsthesia and pain in the lower limbs.

The man showed pallor, a pale smooth tongue, ataxia of the lower limbs, diminished sensibility, and absent tendon reflexes. The blood picture was typical of pernicious anæmia: the hæmoglobin was 50 per cent.; red cells, 1,800,000; colour-index, 1·4; and white cells, 4800 (lymphocytes 65 per cent.). Anisocytosis was observed in the films. Four months' treatment with iron and arsenic and blood transfusions resulted in no improvement, the blood picture being: hæmoglobin, 35 per cent.; red cells, 1,400,000; and colour-index, 1·25. Megaloblasts were now present in the blood films. Liver therapy was commenced and the blood figures at the end of 14 days showed a hæmoglobin percentage of 60, and 2,300,000 red cells. Unfortunately, the man died of broncho-pneumonia 17 days after liver diet had been instituted.

Hochrein[4] also reports two cases of gastrectomy in which an anæmia resembling pernicious anæmia was found, and in both of which marked improvement followed liver therapy.

The first was a man, aged 55, who had had a gastrectomy for carcinoma eight years previously. The blood showed hæmoglobin, 45 per cent; red cells, 1,560,000; colour-index, 1·7; and white cells, 6600. Megaloblasts were seen in the films. The blood figures after liver treatment showed: hæmoglobin, 70 per cent.; red cells, 4,800,000; colour-index, 0·84; and white cells, 6600, with an eosinophilia of 19 per cent. His second case was a woman who had had her stomach removed for gastric ulcer nine years previously. The blood picture was that of a secondary anæmia: hæmoglobin, 43 per cent.; red cells, 3,420,000; and colour-index, 0·79. Here again improvement with liver was noticed, hæmoglobin rising to 85 per cent., the red cells to 4,460,000, and the colour-index to 0·9. Hochrein thinks that, with the history of gastrectomy and the response to liver therapy, the anæmia was the result of the gastrectomy.

Crohn[5] refers to one of his cases of syphilis of the stomach, in which subtotal resection had been performed, which developed a severe anæmia of the primary type several years after the gastrectomy. It is interesting that, according to Crohn, anacidity is rather characteristic of gastric syphilis. In 1924 Garvey and Stern[6] published a report of a case in which the symptoms and signs of subacute combined degeneration of the cord were obvious, and in which were found an achlorhydria, high colour-index (but no marked anæmia), atrophy of the mucous membrane of the tongue, and lemon-tinted skin. Not, however, until the post-mortem examination was the presence of a carcinoma of the stomach suspected. The histological changes of subacute combined degeneration of the cord were verified by section. In 1925 Ellis[7] reported the details of a case in which a man underwent a partial gastrectomy for a carcinoma in 1909, and 16 years afterwards presented signs of subacute combined degeneration of the cord with a sore tongue and a blood picture suggestive of pernicious anæmia.

Details of Five Cases.

The following are the details of five cases, four of carcinoma of the stomach and one probably of the pancreas, in which liver therapy was given and observed. In all the following features were present: a lemon-tinted skin, symptoms of anæmia, and achlorhydria.

Case 1.—A man, aged 56, complained of dyspnœa on effort, and a lemon-tint of the skin which would "come and go." He had no gastric symptoms, enjoyed his food, and in all respects felt normal, with the exception of some shortness of breath on exertion for three months. Examination showed a definite yellow pallor in a well-built man. Fractional gastric analysis showed an achlorhydria with rapid emptying and no evidence of obstruction at the pylorus. Enlarged glands were palpable in the left cervical region, and a barium meal revealed a large filling-defect extending along the posterior wall of the stomach. The blood examination showed: red cells, 2,800,000; hæmoglobin, 43 per cent.; white cells, 10,200; and colour-index, 0·7. The film showed the red cells to be poorly stained but with poikilocytosis and some red cells larger than normal. As the condition was regarded as inoperable and no surgical relief of obstruction was necessary, liver therapy was given, and the patient's response observed.

In 14 days the following figures were noted: red cells, 3,040,000; hæmoglobin, 44 per cent.; white cells, 6200; colour-index, 0·56. Two months after treatment the dyspnœa had completely disappeared, no anæmia was apparent, and the patient seemed to be better in every way. The count was then: red cells, 4,650,000; hæmoglobin 76 per cent.; white cells, 7600; colour-index, 0·84. A short time afterwards the gastric symptoms became obvious, the patient began to vomit and signs of emaciation rapidly advanced, and he died a few weeks after the onset of obstructive symptoms. This case, although by no means an anæmia of primary pernicious type, showed a definite response to liver therapy and had, in addition, as well as a marked anæmia, an achlorhydria and a rapidly emptying stomach.

Case 2.—A woman of 50 complained of dyspnœa, yellow appearance, and palpitations of five months' duration, with loss of weight noticeable for two months. Clinical examination disclosed a tenderness in the epigastric angle, a lemon-tint of the skin, and a complete achlorhydria with high total acid values, blood in the resting juice, and a stomach empty in one hour. The barium meal showed a filling-defect in the region of the pylorus and a rapidly emptying pyloric canal. Operation was advised but was refused. The blood at this time showed: red cells, 2,250,000; hæmoglobin, 45 per cent.; white cells, 6000; colour-index, 1·0. A film showed moderate anisocytosis and poikilocytosis but no nucleated forms. The patient was kept under observation and liver given in the diet. As this was easily tolerated, it was possible to observe the effect.

After liver.	Red cells.	Hæmoglobin percentage.	White cell.	Colour-index.
14 days ..	3,210,000	43	8,200	0·7
21 „ ..	3,560,000	45	6,800	0·6
28 „ ..	3,860,000	45	10,200	0·6
35 „ ..	3,500,000	46	8,400	0·6
42 „ ..	3,470,000	48	8,200	0·7
3 months..	4,380,000	42	10,000	0·5

While the red cells showed a definite increase, the hæmoglobin value remained stationary over this period. The subsequent history was the usual rapid downhill course, somewhat relieved by a gastro-enterostomy. Throughout the time of observation the stools contained occult blood, and it is somewhat remarkable that in spite of the persistent bleeding the red cells increased in number over a limited time, and that this increase was accompanied by definite improvement in the general appearance. This case again responded to a certain extent to liver therapy, and had, in common with the other, an achlorhydria and a rapidly emptying stomach.

Case 3.—A woman, aged 49, complained of sickness after food for three months, loss of appetite, and extreme shortness of breath. She had observed that her stools had been pale in colour and bulky. A lemon-tint of the skin had been commented on by her friends. She had lost weight and had for the last three months suffered from abdominal pain, made worse by the ingestion of food. Examination showed a definitely yellow colour, dyspnœa, and much anæmia. The subcutaneous fat was well retained and no œdema was obvious. The tongue was dry and glazed, with atrophy of the papillæ. Abdominal examination disclosed a large, hard mass in the lower abdomen, and a smaller one in the epigastrium. Gastric analysis showed a complete achlorhydria. A barium meal showed no gastric lesion. The urine contained 100 units of diastase, and bile-pigments were present; the icterus index of the blood was 25, and the van den Bergh reaction indirect. The stools contained excess of total fats, and the reaction for occult blood was negative. A definite diagnosis was not possible, but a tentative diagnosis of carcinoma of the pancreas was made, and as no surgical interference was contemplated, the patient was kept under observation.

The blood examination showed: red cells, 1,300,000; hæmoglobin, 26 per cent.; white cells, 7200; colour-index, 1·0. Four days after commencing liver therapy the patient became so dyspnœic and distressed that a blood transfusion had to be given. Œdema of the face and hands appeared, and the patient seemed to be in a critical state. Vomiting was so frequent and persistent that it was quite uncertain how much liver extract was absorbed. However, 13 days after commencing liver therapy the blood figures were: red cells, 1,650,000; hæmoglobin, 20 per cent.; white cells, 6000; colour-index, 0·7. Nucleated reds and some megalocytes were present, and one megaloblast was seen. Poikilocytosis and polychromatophilia were very obvious.

After liver.	Red cells.	Hæmoglobin percentage.	White cells.	Colour-index.
3 weeks ..	2,040,000	31	—	0·8
4 „ ..	2,800,000	48	7000	0·9
5 „ ..	3,670,000	60	6100	0·84
7 „ ..	3,700,000	60	4600	0·8
8 „ ..	4,300,000	62	6000	0·82

At this time, eight weeks after the institution of liver therapy, the patient looked well, there was no dyspnœa, and no obvious anæmia. The digestive disturbances were as before, and the abdominal masses were palpable. In this case no occult blood was found in the stools, and no evidence of a bleeding-point was found at any time. The diagnosis of cancer has not been verified, but what is known is that this patient, like Cases 1 and 2, had an anæmia associated with an achlorhydria, showing evidence of a malignant condition of the abdomen, and that this anæmia showed a rapid improvement on a diet of liver extract. The blood films, although showing a superficial resemblance to pernicious anæmia, did not resemble the primary type, nor did the red cells and the hæmoglobin proportion. However, the lemon tint of the skin, the atrophic tongue, the achlorhydria, and the rapid response to liver extract, suggest that it was an anæmia in some ways analogous to that of pernicious anæmia.

Case 4.—A man, aged 56, was seen only nine days before death. He had always enjoyed good health, and had complained of weakness and shortness of breath for only six weeks. For two weeks before he sought advice he had suffered with pain in the left side of the abdomen. Diarrhœa had been present for one week and anorexia for six weeks. He had never vomited. He was extremely pale with an icteroid tint, very emaciated, and dyspnœic. The distended abdomen contrasted markedly with the wasting of the rest of the body, and a hard mass was palpable in the epigastrium. No œdema was present, and no organic nerve signs were elicited. A gastric analysis showed complete achlorhydria, and a resting juice foul in smell with a total acid value of 34. A diagnosis of carcinoma of the stomach was made. Examination of the blood showed: red cells, 1,300,000; hæmoglobin, 30 per cent.; white cells, 12,000; colour-index, 1·15. The red cells were well stained and varied in size; numerous megalocytes were present, and one or two megaloblasts were noted. Poikilocytosis and polychromatophilia and an eosinophilia of 4 per cent. were present. Liver extract was given. One week later the blood count was: red cells, 1,340,000; hæmoglobin, 30 per cent.; white cells, 11,000; colour-index, 1·2. The patient did not improve but became more dyspnœic, and died in nine days. Post-mortem examination showed a hard growth of the pylorus extending along the lesser curvature and the posterior wall of the stomach. Secondary deposits were present in the liver, but no bony deposits were found. The bone-marrow was red throughout, and showed an erythroblastic reaction resembling that seen in pernicious anæmia. The death of the patient prevented observation on the effect of liver therapy, but here again the achlorhydria was associated with profound anæmia which, in this case, apart from the leucocytosis, was indistinguishable from that seen in pernicious anæmia.

Case 5.—A man, aged 57, had suffered from anæmia for four years with indefinite anorexia for six months and showed signs of wasting and of œdema. He had no vomiting or bleeding. There was a marked lemon-tint of the skin with pallor of mucous membranes. Œdema of the feet, abdominal wall, hands, and elbows was present. A fractional gastric analysis showed a resting juice with a high total acid value, of bad odour and large in volume with complete achlorhydria. Occult blood was present in the fæces. With such an advanced state no interference was contemplated, the patient being too ill even to be radiographed. The blood examination showed: red cells, 1,900,000; hæmoglobin, 17 per cent.; white cells, 7400; colour-index, 0·4. Anisocytosis and poikilocytosis were marked in the blood film, but no nucleated forms were observed. Liver extract was given, and 14 days later the following figures were noted: red cells, 2,100,000; hæmoglobin, 16 per cent.; colour-index, 0·4. The patient unfortunately died quite suddenly four days afterwards, and 18 days after the commencement of liver therapy. Whether a response would have been forthcoming had the patient lived remains undecided. Post-mortem examination showed a large, hard growth at the pylorus, with a softer extension along the posterior wall of the stomach, secondary deposits in the lymphatic glands, and an erythroblastic reaction in the bone-marrow. No secondaries in the bone-marrow were discovered. This case of carcinoma ventriculi, therefore, showed an achlorhydria associated with a marked anæmia in which the gastric symptoms were in abeyance, but in which the response to liver therapy remains problematic.

Comments.

In pernicious anæmia the constancy of achlorhydria is one of the most valuable diagnostic features. While Faber[8] and Hurst[9] have always held the view that the achlorhydria, or rather achylia gastrica, is the essential basis for the development of this anæmia, definite direct proof of this has been lacking until the recent work of Castle,[10] who has shown that an equally good response to that obtained by liver therapy can be secured in cases of pernicious anæmia if they are given beef that has been predigested with normal human gastric juice. By experiments of exclusion he has shown that it is not the hydrochloric acid nor the pepsin (at least commercial pepsin is inactive) in the gastric juice that is the active principle, but some other unknown factor present in healthy gastric juice. This substance, according to Castle's view, presumably present in normal gastric juice only, is able, by its action on beef muscle, to produce some agent which is capable of acting as efficiently as liver in bringing about a remission in pernicious anæmia; and he believes this to be the factor which, in some unknown way, prevents the development of pernicious anæmia in normal persons. This work is of profound interest for, if it is confirmed, it will make the relationship of achylia and pernicious anæmia one of more than diagnostic importance. It will become of ætiological significance. It will also bring into line the anæmias that have been observed following gastrectomy and those observed in carcinoma of the stomach. The ready response to liver in these, as distinct from other secondary anæmias, supports the conception that there is a relationship between these anæmias and pernicious anæmia, and, in addition, that the development of pernicious anæmia is the sequel to a defective gastric secretion.

If pernicious anæmia is so closely related to gastric secretion, and if its advent is dependent upon achylia, it may be asked why a primary anæmia is not more frequently seen in cancer and gastrectomy cases. The reason may be the difference in time; pernicious anæmia is an insidious disease and achylia has been noted in some cases many years before the development of any anæmia, while in cancer it is rare for the patient to be alive for more than two years after the symptoms of anæmia have become obvious. Again, investigations on cases of gastrectomy have shown that some gastric secretion always takes place, even if there is no free hydrochloric acid, a sufficient amount of gastric mucosa being left to produce some secretion. For this reason the underlying secretory disturbances can hardly be regarded as identical in pernicious anæmia and gastrectomy. The five cases given in this paper showed an achlorhydria associated with an anæmia, and three responded to liver therapy. Their ready response to liver brings them into line with pernicious anæmia, and emphasises the common factor—a deranged gastric secretion. The two cases that died showed a bone-marrow similar to that seen in pernicious anæmia, thus still further emphasising the similarity.

From a study of the literature and the foregoing cases the response of certain types of anæmia of gastric origin to liver therapy seems to be comparable to that of the primary anæmia. Two conclusions naturally follow from this: first, improvement through liver therapy in cases of anæmia associated with achlorhydria is not diagnostic of pernicious anæmia: secondly, liver therapy may prove of therapeutic value in gastric conditions, in pre- and post-operative periods, in which there is an anæmia associated with an achlorhydria, although the blood count be not of the pernicious or primary type.

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References.

1. Moynihan, B.: THE LANCET, 1911, ii., 430.
2. Hartman, H. R.: Amer. Jour. Med. Sci., 1921, clxii., 201.
3. Dennig, H.: Münch. med. Woch., 1929, lxxvi., 633.
4. Hochrein, M.: Ibid., 1929, lxxvi., 1327.
5. Crohn, B. B.: Affections of the Stomach, Philadelphia, 1927, p. 797.
6. Garvey, J. L., and Stern, L. D.: Amer. Jour. Med. Sci., 1924, clxviii., 847.
7. Ellis, A.W. M.: Proc. Roy. Soc. Med. (Sect. of Neurol.), 1925, xviii., 27.
8. Faber, Knud: Lectures in Internal Medicine, New York, 1927, p. 63.
9. Hurst, A. F.: Guy's Hospital Reports, 1926, lxxvi., 287.
10. Castle, W. B.: Jour. Clin. Invest., 1928, vi., 2; Proc. Roy. Soc. Med., 1929, xxii., 1214.

A NEWCASTLE WAITING LIST.—In support of their appeal for £150,000 for enlargement, the Governors of the Royal Victoria Infirmary, Newcastle-on-Tyne, state that the waiting list contains nearly 3000 names, and that the Infirmary has "become, without exception, the most overcrowded hospital in Great Britain." Almost every week close upon 100 additional beds have to be placed between others in the wards to admit accidents and urgent cases. Whereas in 1906 the in-patients were 4899, in 1929 they numbered 14,460. In the same period the out-patients have grown from 50,000 to 355,000, and operations from 4000 to well over 12,000.

ANÆSTHESIA FOR THORACOPLASTY IN PULMONARY TUBERCULOSIS.*

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FROM the anæsthetic standpoint, thoracoplasty and similar operations on the tuberculous subject differ a good deal from operations performed on the patient with a normal respiratory mechanism. I propose to give briefly my observations in some 300 anæsthetics for this type of operation alone.

Condition of the Patient.—Operation is only decided upon when medical measures have failed to arrest the disease. The patient has therefore had toxæmia for a considerable period from tubercle and its attendant secondary infection. The vital capacity is below normal and the blood pressure frequently low. There is often physical exhaustion from the ever-recurring effort to cough up accumulations of sputum. It is apparent, therefore, that recovery from any operation undertaken to aid in arresting the disease should not be hampered by the effects of the anæsthetic. At the same time, it must be remembered that such operations are not in the nature of emergencies. The patient has been under the care of the physician, who has made every effort to secure the best possible physical condition before operation. Vital capacity and blood pressure readings are taken, and before the patient comes to the theatre he is placed for a time in the position which enables him best to clear his lungs of sputum.

Requirements of the Operation.—The surgeon requires the patient in the lateral position, the healthier side of the chest being supported by an air-cushion. This position is not an easy one in which to keep a mask air-tight on the patient's face or in which to control the air-way. There is a tendency also for the movements of the lower side of the chest to be impeded, although the position of the air-cushion in the axilla allows a certain amount of free expansion at the pulmonary base. The operation involves the exposure of a wide bleeding surface in a patient whose resistance to shock and hæmorrhage is strictly limited. Muscular relaxation is not absolutely essential, however, and deep anæsthesia is therefore unnecessary. The time required for operation is short, the average being 25 minutes.

Choice of Anæsthetic.

Having considered the condition of the patient and the nature of the operation, it is apparent that the anæsthetic must fulfil certain requirements, which may be classified as follows: (1) Recovery should be rapid in order that any accumulation of sputum be actively expelled immediately after the operation. (2) For the same reason the cough reflex should be present during the progress of the operation. (3) There should be no irritation or damage to the patient's lungs, either immediate or remote. (4) The anæsthetic should not cause post-operative acidosis. It is obvious that ether and chloroform should be omitted if it is possible to use less toxic agents. There remain at the disposal of the anæsthetist local analgesia, on the one hand, and general anæsthesia with nitrous oxide and oxygen, or ethylene, on the other; or a combination of the two. I shall briefly consider the merits and disadvantages of each.

Local Analgesia.—The advantages are: (1) It causes no irritation or damage to the lungs. (2) It causes no post-operative vomiting or acidosis. (3) There is definitely less bleeding during the operation. The disadvantages are: (1) The length of time required for extensive infiltration. (2) The possibility of immediate toxic symptoms following the injection of considerable quantities of novocain. (3) A slightly greater tendency towards delayed healing and sepsis of the wound. (4) The undesirability of extensive rib resections in a conscious patient, from whom it is difficult to conceal this essential part of the operation.

General Anæsthesia with Nitrous Oxide and Oxygen.—The advantages here are: (1) An unconscious patient. (2) The attention of the surgeon being undivided the operation is consequently of shorter duration. (3) Recovery is rapid. (4) There are no toxic effects. The disadvantages are: (1) The necessity of a preliminary narcotic. (2) The difficulty of administering nitrous oxide and oxygen with a mask to a patient in the lateral position. (3) A certain degree of sub-oxygenation is necessary sometimes to obtain anæsthesia. (4) There is more hæmorrhage than with local analgesia.

Discussion.

It is obvious that each of the anæsthetics mentioned has certain factors to commend it. I am aware that local analgesia is the routine for thoracoplasty in many continental clinics, and to some extent in this country, but think it should be employed only when the operation is a minor one involving the resection of one or two ribs. There may be special instances in which local analgesia is preferable—for example, in a patient of suitable temperament or where a general anæsthetic is definitely contra-indicated—but I am convinced that there is less liability to shock when thoracoplasty is performed on the fully unconscious patient. As a rule a general anæsthetic is demanded by the patients themselves.

In referring to the disadvantages of general anæsthesia with nitrous oxide and oxygen, I have mentioned the necessity of a preliminary narcotic. It is well known, of course, that satisfactory anæsthesia with nitrous oxide and oxygen can only be obtained with the aid of efficient preliminary medication. Some physicians hold that the administration of a drug which may act as a respiratory depressant and sedative is undesirable for a patient secreting a large amount of sputum. In theory this may be correct, but cough being one of the troublesome symptoms from which these patients suffer, it may be assumed that most of them have tried every available remedy to alleviate it. This may account for the fact that, in my experience of these cases, I find they tolerate morphia well. It is my custom to give an adult omnopon gr. 1/3, and scopolamine gr. 1/150, and I have observed no ill-effects from this injection. While dealing with this point, I might mention that paraldehyde or avertin per rectum are contra-indicated in cases of this type, because it is essential that the patient should clear his lungs of sputum as soon as possible after the operation.

The difficulty of maintaining a mask in position on the patient's face can be overcome to a great extent with the aid of a rubber contrivance such as that devised by Dr. R. J. Clausen for the purpose. This difficulty, and with it the complete control of the patient's airway, could be easily dealt with by employing endotracheal anæsthesia, but I am of opinion that this method is contra-indicated in thoracoplasty. Intubation requires a deeper initial anæsthesia and a deeper maintenance level to keep the cough reflex in abeyance, while the tube is in the trachea, than is desirable in these operations. Deeper maintenance level also means the addition of ether or chloroform if an undesirable degree of cyanosis is to be avoided. This militates against a quick recovery, which, as I have already pointed out, is essential in these cases. With regard to sub-oxygenation in connexion with nitrous oxide and oxygen, I feel sure of the antagonism of physicians to its occurrence in any degree. Deliberate sub-oxygenation in the presence of a free air-way, however, is a very different matter from cyanosis due to respiratory obstruction, and it is on the latter that most fears are founded. The fact remains that the degree of sub-oxygenation produced is not dangerous and has no after-effects, as far as can be ascertained.

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* A paper read before the Tuberculosis Association on Jan. 17th.

Anæsthesia can be maintained with 10 per cent. to 20 per cent. oxygen in most cases.

The relative increase in hæmorrhage in general anæsthesia as compared with local is counterbalanced by the increased coagulability of the blood. Hæmorrhage is easly controlled and there is no tendency to recurrence.

Conclusions.

At the Brompton Hospital, where most of my experience has been gained while working with Mr. Tudor Edwards, we have found that the best results are obtained with nitrous oxide and oxygen anæsthesia combined with block of the intercostal nerves as soon as the ribs are exposed. The injection by the surgeon of 1 c.cm. of 1 per cent. novocain in the region of each nerve takes but a few seconds and the total quantity injected is small. It has been observed that there is less liability to shock when the ribs are divided after nerve-block than when the injection is omitted.

We have kept anæsthetic records of all cases, and the results with this combined method have given cause for satisfaction. Of 101 thoracoplasties, representing 202 operations performed by Mr. Tudor Edwards on tuberculous patients, the operative mortality has been five, all occurring in the first three weeks after operation. One patient died on the third day from pulmonary embolism; one died on the sixth day from acute spread of the disease on the opposite side; one on the twentieth day from tuberculous pneumonia in the opposite lung; one on the eighth day after the second stage from syncope; and the last from tuberculous pneumonia on the fourth day.

We preserve an open mind upon the matter of anæsthesia, however, and I have used ethylene instead of nitrous oxide with a view to obtaining better results. So far, I have not found ethylene to be vastly superior to nitrous oxide. It is true that anæsthesia can be maintained with a greater percentage of oxygen when using ethylene—an undoubted advantage. But the objectionable smell of the gas and its explosive qualities have deterred us from further experiment.

Clinical and Laboratory Notes.

PURPURA AS A SOLE SIGN IN A CASE OF MENINGOCOCCAL SEPTICÆMIA,

WITH NOTES OF ITS INCIDENCE OTHERWISE.

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THE patient, a tram-driver aged 30, was at work as usual on April 12th, 1929, and seemed in his usual health.

On April 13th he went to work without making any complaint, but an hour later—viz., 8.30 A.M.—he returned home, as he felt sick and shivery. Shortly afterwards he vomited some black material and passed a black motion. In the afternoon he noticed that a rash had appeared upon his body. The sickness continued and he complained of coldness and pains in the legs and feet. A doctor was consulted and at once sent him into hospital, where he arrived at 1·30 A.M. on the 14th.

On admission he was found to be a well-built man. He was quite clear mentally, but very collapsed. The skin was clammy and covered with a deep purpuric rash, which affected the whole surface, head, trunk, and limbs, and was most marked on the back. The hæmorrhages varied in size from a pin-point to a blotch as large as half a crown. The skin surface was dusky and the lips were deeply cyanosed. No urine was obtainable. His temperature was 102·5° F., the respirations were regular, shallow, and frequent, and his pulse, which numbered 120 beats a minute, was very small and soft. He was very *thirsty, and shortly after admission vomited a small quantity of blood, both fresh and altered. The pupils were small* and equal, and responded to light. There was no retraction or stiffness of the neck, and Kernig's sign was negative.

He did not respond to treatment; the cyanosis increased and fresh petechiæ made their appearance, the pulse failed, and he died at 2·45 A.M.—less than 19 hours after the onset of his illness.

Post-mortem Examination.—There was a diffuse hæmorrhagic rash over the whole body, including the conjunctivæ. A few subpleural ecchymoses were scattered over the lungs, and subendocardial purpuric spots were present in all the chambers of the heart. The stomach and intestine showed some submucosal hæmorrhages. The meninges were congested, but no excess of cerebro-spinal fluid was found, nor was it unduly turbid. A lumbar puncture was done before the cord was exposed. On examination of this a few Gram-negative diplococci were found. On sectioning the brain nothing of note was found apart from superficial congestion.

This case is interesting on account of the fulminant nature of the symptoms and the predominance of the hæmorrhages. It is, of course, well known that in meningococcal infections death may ensue within a short period of the initial symptoms. Herrick[1] states that "death may occur within four to twenty-four hours of onset." Foster and Gaskell[2] quote the type of case where a man had gone to bed apparently in his usual health and was found dead in his bed in the morning; Worster-Drought and Kennedy[3] give an instance where a man was quite well all day and became ill in the evening; in the morning he was delirious and died half an hour after admission to hospital. These cases, however, are unusual.

The name "spotted fever" denotes the frequency with which hæmorrhagic eruptions occur in this disease, but hæmatemesis and melæna are rarely met with and hæmaturia is also uncommon. The following list shows the relative frequency of the causes of hæmorrhagic eruptions as met with in medical wards. During the last twenty years 73 cases in which a purpuric rash was a prominent feature were admitted into the unit. The clinical diagnosis in these patients was as follows: 32 cases might be grouped as septicæmia (bacterial endocarditis 27, cerebro-spinal fever 2, erysipelas, pyæmia, sepsis following burns, 1 each); 7 were leukæmias; 2 pernicious anæmia; 1 scurvy; 1 hæmophilia; 1 acute nephritis; 2 were associated with arterio-sclerotic disease, 1 with debility, and 1 with trauma. The remaining 25 cases were examples of "purpura," 9 of which died in the wards. In five of these nine cases post-mortem examinations were conducted and revealed no further cause of death. (No platelet counts were done.)

A Classification of Purpura.

In consideration of the foregoing cases the following classification of purpura was compiled from various sources. The condition may be defined as "spontaneous hæmorrhages into the skin, mucous membranes, and organs; with or without hæmorrhage into the mucous canals." Beware of flea-bites!

Group 1. (*a*) Purpura hæmorrhagica: the blood platelets are deficient; (*b*) purpura simplex: ? cause. (*c*) purpura rheumatica: purpura abdominalis: anaphylactoid purpura, possibly an intoxication due to histamine-like substances.

Group 2. *Secondary Purpuras* may be due to (*a*) chemical poisons—e.g., potassium iodide, mercury, arsphenamine, benzol, and snake poison; (*b*) infections: subacute bacterial endocarditis, cerebro-spinal fever, small-pox, and scarlet fever; the hæmorrhagic forms of the exanthemata, black measles, malignant scarlet fever, hæmorrhagic diphtheria, and hæmorrhagic small-pox; (*c*) cachexias, severe anæmias, and leukæmias; (*d*) mechanical causes: convulsions, whooping-cough, and senility; (*e*) nervous lesions: tabes dorsalis.

Group 3. *Scurvy.*—Due to the absence of water-soluble "C" vitamins.

Group 4. *Hæmophilia.*—The coagulation of the blood is delayed, due to a delay in the formation of the thrombin (hæmorrhagic disease of the new-born).

Group 5. *Fibrinopenia.*—Due to a complete lack of fibrinogen.

Our thanks are due to Dr. John M. Cowan, Royal Infirmary, Glasgow, for his advice and supply of clinical material and records.

References.

1. Herrick, W. W.: Arch. Int. Med., 1918, xxi., 541.
2. Foster, M., and Gaskell, J. F.: Cerebro-spinal Fever, Cambridge, 1916, p. 41.
3. Worster-Drought, C., and Kennedy, A. M.: Cerebro-spinal Fever, 1919, p. 138.

SUBLINGUAL DERMOIDS.

BY RICHARD WARREN, M.D., M.CH. OXF., F.R.C.S. ENG.,
SURGEON TO THE WESTON-SUPER-MARE HOSPITAL;
AND
N. CARWARDINE COOPER, M.R.C.S. ENG.,
ASSISTANT SURGEON TO THE HOSPITAL.

THERE is still some uncertainty about the origin of sublingual dermoid cysts, and, according to Colp,[1] they may belong to one of two groups. The first he considers not to be true dermoids, as they do not contain the appendages of true skin. The second group includes the true dermoids, and may originate either (1) as epithelial "rests" from the tuberculum impar, or (2) from the union of the first and second branchial arches. Colp states definitely that the median thyroid Anlage (tractus thyroglossus) "can never give rise to true dermoid tumours."

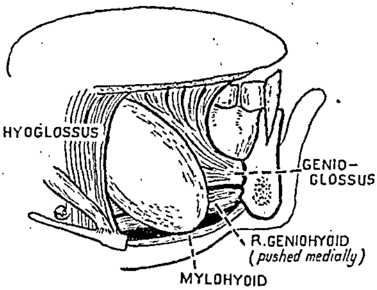

Diagram showing position of the cyst.

These true dermoids have been divided by Barker, Streickheisen, Marchant, Debonnelle, Lannelonge, and others into various sub-varieties, chiefly median and lateral. The latter lie between the latero-inferior aspect of the tongue and the mandibular ramus, above the mylohyoid muscle. The median variety are more truly sublingual in position. Median cysts may be further subdivided according to whether they are above or below the geniohyoid muscle. These cysts are probably present congenitally, but become more pronounced in early adult life when the epithelial tissues—hair, sweat, and sebaceous glands—become more definitely active. Some authorities consider the increase in size to be due to a low-grade infection, but Colp finds the contents to be uniformly sterile. Clinically they may either encroach into the floor of the mouth, where they must be distinguished from ranulæ or angiomata, or they may bulge as painless swellings in the submental region, where a further differentiation from lipoma is necessary.

They are sufficiently uncommon, judging from the literature on the subject, to warrant the publication of this case.

A boy of 17 complained of a swelling in the floor of the mouth and below the chin; it was inconvenient but caused no great difficulty in swallowing. Some months before a surgeon had made an attempt to deal with the condition through the mouth but without success. On examination there was a soft median swelling below the chin, and inside the mouth there was a smooth, fluctuating swelling below the tongue, which was pushed back. The two swellings were evidently continuous. The swelling in the mouth was median and faintly yellow in colour, suggesting a dermoid cyst seen through the mucosa of the sublingual region.

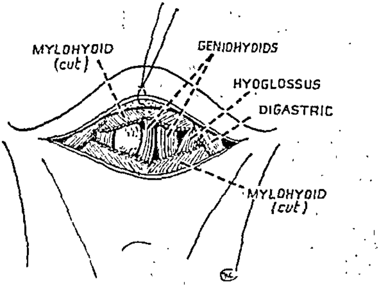

Diagram of dissection. The cyst is seen between the severed portions of the mylohyoid muscle.

A transverse incision was made midway between the chin and the hyoid bone; the right digastric was retracted and the mylohyoid divided transversely. The right genio-hyoid muscle was then pulled forward and the yellow cyst exposed, covered by the thinned and spread-out fibres of the geniohyoglossus. These last were dissected off readily, and the cyst, which extended up and far back into the tongue, removed intact. The mylohyoid was sutured and the wound closed with a temporary drain; it was well healed in a week.

The cyst was ovoid in shape and about 2½ by 2 in. in size. The wall was thin and lined with epithelium, and the cyst contained the usual porridge-like, acid-smelling material found in dermoids, but without any hairs.

MULTIPLE CARCINOMATA OF SKIN IN A CHIMNEY SWEEP.

BY W. DONALD BEDFORD, M.B. LEEDS,
RESIDENT SURGICAL OFFICER, HERTFORD COUNTY HOSPITAL.

A PATIENT, aged 45, attended the Hertford County Hospital in June, 1929, complaining of an ulcerated swelling of the lower lip (outer quadrant). He had been a chimney sweep for 20 years and had had the tumour on his lip for three months; it had discharged and occasionally bled when scratched. The tumour had an indurated edge and a central ulcer which bled easily when the scab was removed; there were no palpable glands. A V-shaped excision was done, and the lip healed normally (pathological report: epithelioma). He was sent to the Radium Institute, London, where radium was applied over the submaxillary region.

The patient reappeared at the hospital at the beginning of November, and he now complained of a similar tumour on the left side of the scrotum; it had been preceded by an eczematous condition of the skin of the scrotum of varying severity for some months. On examination the tumour presented an extraordinary similarity to the original tumour on the lip, both in colour and appearance. There were no palpable glands in either groin. The tumour was excised and pathological report showed it to be a growth of the same type as the one previously excised.

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[1] Colp, R.: Surg., Gyn., and Obst., 1925, xl., 183.

I have to thank Mr. Harold Medlock, senior surgeon to the hospital, for allowing me to publish this case, which was under his care.

Medical Societies.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

AT a meeting of this Society in London on Jan. 31st, with Dr. FRANCIS J. COUTTS, the President, in the chair, Lieut.-Colonel E. T. BURKE (Manchester) read a paper on the

TREATMENT OF WASSERMANN-FAST SYPHILIS.

He said that in considering the problem of Wassermann-fast patients it must be taken for granted (1) that the diagnosis of syphilis was correct; and (2) that the patient had received treatment of such quantity, quality, and duration as experience had shown usually to have the effect of rendering the serology permanently negative. What criteria were to be adopted for each of these two things? For the present, he thought, a positive Wassermann must be taken as the criterion of diagnosis; and a persistently positive result in a treated patient as an indication of uncured syphilis. One could go further, and reason that a persistently positive serology points to the fact that the treatment given to that particular patient has in this instance been inadequate. While a persistently positive serology in a treated case undoubtedly indicated uncured syphilis, a negative serology in such cases did not necessarily imply that the disease had been eradicated. Warthin's experience (see THE LANCET, 1929, ii., 556) seemed to show that the attainment of a negative W.R. seldom meant that the patient was cured. It was necessary to look well beyond the permanent negative, and find an answer to the question of how far beyond that must treatment be pushed in order to sterilise the patient's tissues. It seemed clear that the answer must be provided by the histologist and not by the serologist.

Colonel Burke emphasised the need for "checking up" autopsy findings in treated syphilitics against the treatment given during life. He believed that with proper handling cases of early syphilis, at least, could be cured not only clinically and serologically, but also histologically; in other words, that the human body could be completely sterilised so far as the *Treponema pallidum* is concerned. That was the ultimate objective of treatment, but for practical purposes at the moment it was necessary to rely upon the Wassermann test. The very least that should be aimed at was to render our cases permanently negative. Unless the postulate was accepted that a positive Wassermann meant syphilis requiring treatment, then the discussion could not even begin. Two classes of case came within their purview: firstly, there was the syphilitic whose serological reaction immediately after treatment was negative, but after a variable interval again became positive (Wassermann-relapse). Secondly, there was the syphilitic whose serum at no period ever receded into a negative (Wassermann-fastness).

The various opinions on treatment might be grouped into two schools: (1) that which, using arsenobenzol compounds and bismuth (or mercury) administers these concurrently; and (2) that which, using the same remedial agents, administers them in alternating series. Col. Burke belonged to the latter school. He had distributed among those present the schemes of treatment adopted in his clinic for (1) early, (2) late syphilis. Among cases of early syphilis treated according to these schemes, there had not yet occurred a case of Wassermann-fastness. In his view if chemical stimuli were applied too strongly, too often, or over too long a period, the reacting tissue might become exhausted. He was therefore in agreement with those who hold that the administration of arsenobenzol alone is essentially wrong. He agreed that the patient must be treated with bismuth as well; but he did *not* agree that the two agents should be given at the same time. By the properly spaced out alternating method, no chance was given to the tissues to become exhausted, and no chance to the treponemata to develop an immunity to the toxalbumin.

Colonel Burke proceeded to consider the matter of treatment, not only of the Wassermann-fastness, but of the Wassermann-fast patient. The first principle to be adopted was to change the mode of attack. And an essential preliminary to that was to rest the tissues. Three months' rest was not time lost; it was essentially a saving both of time and of material. During this rest period the patient should be carefully examined in order to discover the location of the main damage. The result of this examination might be such as to contra-indicate any further antispecific treatment; for example if a serious cardiovascular lesion was present. It might well be that in an elderly man the fibrosis which exists in his aorta may be the only rampart between him and death. The breaking-down of this by iodides might actually precipitate his decease. Such lesions might contra-indicate intravenous medication with arsenobenzol compounds; and so if these compounds were to be given, they must be of the type of sulfarsenol and the route must be intramuscular or subcutaneous. The discovery of the principal site of the disease might call for the exhibition of bismuth alone. The age and circumstances of the patient may be such that treatment is not required—that the patient would not live long enough to enable cure or reduction in the strength of the serological reaction to take place. In any case treatment should be controlled by serological tests which showed fairly fine gradations of the strength of the reaction. In every case of syphilis the exhibition of iodides was called for, except in late and grave cases of cardiovascular involvement. In Colonel Burke's view it was practically useless to give potassium iodide in doses of less than 90 grains a day. Iodides alone had no curative value—they were merely to be used as solvents of fibrous tissue, and to open up the way for the action of arsenicals and bismuth. In his experience the Turkish bath had a distinct value in such cases. There seemed to be at least two factors at work—stimulation of the skin and pyrotherapy. Non-specific protein therapy had a practical bearing upon the treatment of Wassermann-fastness, and should invariably be carried out. The time selected for this should be during the rest-period, before the resumption of truly antispecific treatment. The preparations which he used in his clinic were aolan—a sterile milk protein given intramuscularly—and dmelcos, which was a vaccine prepared from Ducrey's bacillus and given intravenously. The effect of aolan might be provocative.

Colonel Burke summarised his views as follows: (1) Wassermann-fast syphilis is most easily prevented by combined therapy with arsenic and bismuth administered in alternating series over a sufficient period. (2) Under this system, previously untreated cases of early syphilis will be serologically cured in a period varying from 24 to 40 weeks, according to the stage of the disease. (3) Wassermann-fastness implies the presence of living treponemata and structural visceral damage of a progressively fibrotic character. (4) The condition springs from exhaustion of the patient's tissues and the development of resistance by the treponemata. (5) Treatment begins with prevention—avoidance of tissue exhaustion and drug resistance. (6) The actual handling of the established condition implies: rest and rejuvenation of the tissues; elimination of previous storage depots; dissolution of treponemal fibrous-tissue defences; stimulation of natural immunity processes by injection of non-specific protein, and by general tonic treatment; and finally when antispecific treatment is recommenced agents should be adopted which have not previously been used, and they ought to be applied in alternating series.

Treatment and Subsequent Neuro-syphilis.

Colonel L. W. **Harrison** referred to Colonel Burke's opinion that concurrent administration of arsenobenzol and bismuth or mercury led to Wassermann-fastness. A much more important question was whether the alternating courses of these remedies in early cases led to more neuro-syphilis. Colonel Harrison felt strongly that they did. It had been stated that the modern treatment of syphilis led to more and earlier neuro-syphilis, and an inquiry had been made to discover if many of the survivors of the 100,000 soldiers treated for syphilis during the late war had been seen later at neurological or venereal clinics, in pensions hospitals, or in certain mental hospitals suffering from neuro-syphilis. No evidence had been gained in support of the idea that neuro-syphilis had increased under modern methods of treating syphilis, for only six cases had been found. But there was no smoke without some fire, and he had been trying to discover how the treatment given to syphilitic soldiers during the war differed from that given to patients of syphilologists who maintained that modern treatment increased neuro-syphilis. He thought the difference lay in the fact that the soldiers were treated on the concurrent plan. Alurralde and Sepich [1] were strongly of opinion that neuro-syphilis had increased in Brazil, and attributed it to the common practice of using arsenobenzol compounds exclusively. Weatherby,[2] in a paper on the previous treatment of 280 patients who had developed neuro-syphilis, found that of the five whose treatment had begun in the primary stage all but one had received arsenobenzol alone, while the single exception had had arsenobenzol with only three doses of mercury. Out of nine treated in the secondary stage, four had had arsenobenzol only and one mercury only. Bernard [3] had tested the cerebro-spinal fluid of 200 patients and related the findings to previous treatment. The fluid had been pathological in 75 out of 89 treated with arsenobenzol only; in 14 out of 34 treated with alternating courses of arsenobenzol and mercury; and in only 3 out of 42 cases treated with arsenobenzol and mercury concurrently. In the analysis of cases treated at St. Thomas's Hospital, which the Medical Research Council had published, he had contrasted the experience in respect of clinically manifest neuro-recurrence in the cases which had been treated there with that of Moore and Kemp who treated rather more intensively but on the alternating plan.

Colonel Harrison thought it reasonable to suppose that, when an early case was treated first with arsenobenzol, the spirochæte tended to settle in the nervous system and got a start of eight weeks in doing so before the mercury or bismuth, with its perhaps more penetrating and certainly more persistent action, was introduced. Colonel Burke had blamed the concurrent method for Wassermann-fastness, but in the speaker's experience the most intractable cases from this point of view had been patients who had received little or no treatment for a number of years. He thought that probably Wassermann-fastness depended mostly on inaccessibility of the parasites, and he believed strongly in the free use of iodides in these cases.

The Intractable Wassermann Reaction.

Dr. T. **Anwyl-Davies** spoke of the influence of sodium thiosulphate on the Wassermann reaction. It had been stated in America that in 10 out of 28 cases whose Wassermann was persistently positive, the reaction became negative after administering that drug.

Dr. **George Riddoch** thought that any explanations put forward for a persistently positive Wassermann must be, in the present state of knowledge, largely theoretical. The view which he favoured was that it was due to the spirochæte being hidden in situations which were inaccessible to the general blood stream. And there was a small group of cases of tabes in which, in spite of a persistently negative Wassermann, the patient went steadily down hill. There seemed to be no evidence in support of the idea of the development of spirochætal immunity to various remedies, not even clinical evidence. Nor was he able to say whether the use of arsenical preparations led to the more frequent development of neuro-syphilis. There was need, he thought, for a tightening up of the experimental criteria in favour of one view in contrast to others. He had used pyrotherapy for cases of Wassermann-fast tabes, with varying results. In a proportion of cases of G.P.I., the Wassermann reaction of both blood and cerebrospinal fluid became negative after a latent period, and if the patient died of some other disease, healed lesions might be found.

Mr. F. **Fowler Ward** agreed that it was possible to give patients too much arsenobenzol. He used N.A.B. and bismuth. If a man, despite a positive Wassermann reaction, seemed to be in good health, why run the risk of making him worse by giving more arsenical injections? A positive Wassermann should not be regarded as a justification for perpetual interference.

Dr. A. **Sharp** said that if a patient had had syphilis ten years ago and his Wassermann was still positive, it was very unlikely that it would ever become negative, whatever was done. To emphasise to the patient the idea that his Wassermann being positive was important tended to produce a phobia about the disease.

Dr. H. M. **Hanschell** said the discussion seemed to show that it did not matter which method was adopted in cases of early syphilis, so long as enough treatment was given. His difficulty in many cases was that he saw them several times, but not again. He was able to say, from his experience, that a concurrent method of treatment did not produce inveterate Wassermann-positive cases. It seemed that the organism of syphilis localised itself in certain parts of the body, where it proved impervious to treatment. If it seemed that a patient's condition could not be altered, it was wise to leave him alone. He had found that the chronic Wassermann-positive cases were those who had acquired syphilis some years before and had never had treatment for it at all, or at best had only had one or two injections of arsenobenzol.

Dr. H. C. **Semon** remarked that if, as was stated, arsenobenzol was excreted within two days of its injection, there must be four days, in these early stages, in which nothing was happening, and in which therefore the spirochæte, as it was unmolested, could get into the central nervous system. This encouraged concurrent administration, with the arsenobenzol of a substance which was not so quickly excreted—namely, bismuth.

Dr. **Margaret Rorke** said that in her work amongst women she saw comparatively few early cases of syphilis. She agreed with Colonel Burke that it was a good thing to administer different preparations of drugs. Otherwise there was bound, later on, to be a Wassermann-fast stage. Sometimes a prolonged positive case would become negative after an interregnum in the treatment, which presumably had given the general resistance of the patient time to rise.

The **President** agreed on the importance of remembering the part played by the tissues in producing a substance which stopped the evil effects of the spirochæte. Using a variety of remedies might cause a continuance of the stimulus which brought this about. The patient must be sufficiently nourished to enable his tissues to respond to these stimuli. He asked whether the practitioner was necessarily on sound lines in feeling that the end of all antisyphilitic treatment was the production of a negative Wassermann reaction.

Colonel **Burke** replied.

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[1] Bull. Office Int. d'Hyg. Pub., 1928, xx., 1951.

[2] Amer. Jour. Syph., 1929, xiii., 339.

[3] Brux. Méd., 1928, viii., 1602.

Reviews and Notices of Books.

PATHOLOGY OF THE EYE.

By JONAS S. FRIEDENWALD, A.M., M.D., Associate in Pathological Ophthalmology at the Johns Hopkins University, and Pathologist of the Wilmer Ophthalmological Institute. London: Henry Kimpton. 1930. Pp. 346. 21*s.*

THE merit of this work is twofold. The text, being founded on a course of lectures, is in a form that appeals to advanced students of ophthalmology with a minimum of reference to the elements of the subject. Space is thus left for a sound presentation of the various pathological problems presented by the eye, especially in their relation to the problems of general pathology. In addition, there are over 250 excellently clear illustrations in black and white, taken from the pathological collections of the Wilmer Ophthalmological Institute and the Army Medical Museum. These illustrations in themselves constitute a very valuable collection, which even those who possess the larger works on ocular pathology of Sir John Parsons or S. Mayou and Treacher Collins will find useful. As is natural, the most interesting portions of the text are on those subjects to which the author has himself contributed original work. These include observations on subacute panophthalmitis, a term by which, in his opinion, many cases of cyclitis, iritis, and choroiditis arising from septic foci within the eye might properly be known. With regard to the connexion between these cases and septic foci outside the eye, as in the teeth, tonsils, and intestines, his attitude is sceptical. For every organism that comes to the eye, he says, there must be thousands, perhaps millions, that are stopped in the lungs. If the organisms are pathogenic, why do they not produce pneumonia, and if they are not pathogenic why do they cause so much damage to the eye? He proceeds to criticise the theories that have been held to account for this. While not denying the influence of septic foci outside the eye, he evidently considers that the explanation is applied far too promiscuously.

The examination of the eyes of stillborn syphilitic infants has shown in certain cases a diffuse infiltration of the choroid and sometimes of the retina and optic nerve, with wandering cells. In infants that survive, this leads to a widespread interstitial scarring. In some of them the pigment cells are stimulated to migrate into the retina, and these are the cases which in later life are liable to be confused with retinitis pigmentosa.

The author's researches in connexion with glaucoma have led him to disagree with the theory recently propounded by Duke-Elder and others that there is no constant circulation of the intra-ocular fluid, but merely an osmotic interchange between it and the blood, and to support the alternative theory that the aqueous is mainly the product of secretion from the glands of the ciliary body. To oppose the newer theory may appear reactionary, but due weight should certainly be given to Dr. Friedenwald's thesis. In the chapter on senile changes and arterio-sclerosis the author makes an important observation—namely, that in normal eyes the walls of retinal arteries and veins are fused together at the points where these vessels cross one another within a common sheath. Hence the phenomenon of arterio-venous compression so often observed with the ophthalmoscope is due not to increased blood pressure within the artery, but to an actual encroachment of the thickened arterial and venous walls upon the limited space within the enclosing sheath.

It would be easy to continue quoting examples of the interesting matter contained in this book.

PRACTICE OF MEDICINE.

A Text-book of the Practice of Medicine. By Various Authors. Third edition. Edited by FREDERICK W. PRICE, M.D., F.R.S. Edin., Consulting Physician to the Royal Northern Hospital; Physician to the National Hospital for Diseases of the Heart, London. London: Humphrey Milford, Oxford University Press. 1929. Pp. 1871. 36*s.*

THE third edition of this text-book has been revised and brought thoroughly up to date. Some alterations in classification and general arrangement have been made. It is of interest that the article on rickets, which in the last edition was moved from the section on deficiency diseases to that on metabolism, has now returned to its former position. The changes of view and the new discoveries which have occurred during the last three years are noted and described, and this has necessitated much additional material. New articles added include those on lead tetra-ethyl poisoning, carbon monoxide poisoning, basal metabolism, vitamins, megacolon in adults, familial icterus gravis neonatorum, the veronal habit, syphilitic affections of the aorta, heart, and pericardium, and various forms of cardiac irregularity. Much fresh matter in connexion with advances in treatment has also been included. The prophylaxis of syphilis by arsenical preparations, the use of malaria in the treatment of syphilis, the use of plasmochin and plasmoquin in the treatment of malaria, the use of adrenalin, ephedrine, and barium in heart-block, the treatment of ringworm with thallium acetate, and the treatment of diabetes mellitus are a few of the sections which have been added or enlarged. Four further illustrations have been included. The form of the book is unchanged, the print is good, and the index full.

The editor has succeeded in condensing into one volume a remarkable amount of information, and has, moreover, produced a very readable book.

A HISTORY OF SCIENCE.

Its Relations with Philosophy and Religion. By W. CECIL DAMPIER DAMPIER-WHETHAM, M.A., F.R.S. London: Cambridge University Press. 1929. Pp. 514. 18*s.*

THE object of the author of this book is to tell the general story of science, and to present a broad outline of the development of scientific thought, rather than a detailed study of any particular period. After an introductory review, the rest of the book is divided into 10 chapters, of which the first three deal with science in the ancient world, in the Middle Ages, and at the Renaissance period. The Newtonian epoch has a chapter to itself, and so have Nineteenth Century physics and biology respectively. The remaining chapters deal with Nineteenth Century science and philosophic thought, recent developments in biology and anthropology, and the new era in physics; a final chapter is devoted to scientific philosophy and its outlook. To produce a book of such wide scope is a very difficult task—a task that could be undertaken with success only by a man of much general culture, with a well-balanced outlook and a sense of historic perspective as well as an intimate general knowledge of science and of the stages of its development. Dr. Whetham possesses all these qualities and something more besides, for the exposition is excellent and the story equally clear and fascinating, whether we are reading of the contributions to science of Aristotle, or those of Sir Ernest Rutherford.

Considerable space is given to the biological sciences, a section of special interest to medical readers. The story here is developed with sympathy and understanding, and while the advances made by individuals are noted with care, the author keeps his eye all the time on work going on in other branches of science. It is this perspective that makes his book especially valuable. Historians of science too often show a bias in favour of one branch in which they are themselves chiefly interested.

Dr. Whetham has a keen sense of the limitations of physical science which he expresses in his introduction, the last few lines of which may be quoted in full, since they convey well the philosophic outlook of the author. He concludes: "Physical science represents one analytical aspect of reality: it draws a chart which, as experience shows, enables us to predict and sometimes to control the workings of Nature. But the clear insight into the meaning of physical science which is given by modern scientific philosophy shows that by its inherent nature and fundamental definitions it is but an abstraction, and that with all its great and ever-growing power, it can never represent the whole of existence. Science may transcend its own natural sphere and usefully criticise some other modes of contemporary thought and some of the dogmas in which theologians have expressed their beliefs. But to see life steadily and see it whole we need not only science, but ethics, art, and philosophy; we need the apprehension of a sacred mystery, the sense of communion with a Divine Power, that constitute the ultimate basis of religion."

Tissue Culture.

Praktikum der Züchtung von Warmblutgewebe. By Dr. Fritz Demuth, Berlin. Munich: Rudolph Müller and Steinicke. 1929. Pp. 116. M.6.

Dr. Demuth has attempted to produce a simple text-book for those unacquainted with sterile culturing work, rather than a manual for tissue culturists seeking to further their knowledge in the art. He aims at enabling the beginner to master the technique of growing tissue both on coverslips and in flasks, giving descriptions of all the processes involved and illustrating them with some excellent photographs. He lays due emphasis on the difficulties of avoiding bacterial contamination throughout, and on the need for absolute chemical cleanliness. His illustrations of cultures which are faulty in one way or another, because of bad manipulation or incorrect treatment, will be welcomed, but we could have wished for more descriptions and illustrations of cultures under healthy conditions showing good growth. Those unversed in tissue culture will find that the cell growing in cultural media has habits and appearances very different from those of tissue in its normal surroundings in the body; and it is with the appearance of cells, both normal and malignant, in equilibrium with their artificial cultural media, that the worker must become acquainted before he can make any application of the method of tissue culture to the solution of biological problems. Dr. Demuth in his introduction expresses his conviction that tissue culture will open a new door to the domains of biology and medicine, but it must be regarded only as a method and not as a science in itself.

The Chemical Aspects of Immunity.

Second edition. By H. Gideon Wells, Ph.D., M.D., *Professor of Pathology, University of Chicago*; Director of Medical Research, The Otho S. A. Sprague Memorial Institute. New York: The Chemical Catalog Company, Inc. 1929. Pp. 286. $6.00.

This is the second edition of a book which first appeared in 1924. It was reviewed shortly after publication and we then regretted the inclusion of so much literature that the author's critical faculty was left little play. As a work of reference on the chemical aspects of immunity the book has great value, but as a guide to a beginner in this field it lacks coherence. In the second edition the author has considerably enlarged the work, and has included all the recent papers on this vast subject. This has increased the number of opinions recorded; many of them are contradictory, with the result that a general reader must have the greatest difficulty in arriving at the current views on this subject. For example, he would gather, quite incorrectly, from this book, that the Abderhalden reaction is one of extreme importance in immunity, and the same applies to the Meiontadmis reaction. The index is full and accurate, but a separate index of authors would have been appreciated.

Prof. Wells has here provided an elaborate summary of nearly all the papers published on the chemical aspects of immunity. If, in future editions, he would add comments and opinions of his own, the ordinary reader who is perhaps not familiar with the relative merits of the various quoted workers would find the book of considerably more use than it is at present.

Growth and Tropic Movements of Plants.

By J. C. Bose, F.R.S. London: Longmans, Green and Co. 1929. Pp. 447. With 228 figures. 21*s.*

Sir Chunder Bose here publishes another instalment of the results of his devoted labours to investigate the excitability and responses of plants, especially in their analogies with the behaviour of animals. He here describes the effects which he has observed by his extremely delicate recording apparatus of heat, light, gravity, wireless waves, and so on, on the motor responses and growth, and a chapter is devoted to the mechanism of the twining stem. As usual, the author makes no references to the work of other botanists, nor does he relate his own results to what is commonly believed; it is therefore difficult for anyone who is not an expert botanical physiologist to evaluate what he has done. But much of the book is interesting and more of it curious.

Practical Biochemistry.

By A. T. Cameron, M.A., D.Sc. Edin., F.I.C., F.R.C.S., Professor of Biochemistry, Faculty of Medicine, University of Manitoba; Biochemist, Winnipeg General Hospital; and Frank D. White, A.R.T.C., Ph.D. Edin., F.I.C., Assistant *Professor of Biochemistry at the University.* London: J. and A. Churchill. 1930. Pp. 222. 8*s.* 6*d.*

All teachers of biochemistry have their own individual ideas about a practical course, and eventually they nearly all publish a book on the subject. Whilst such a book may be extremely valuable to students working under its author, it does not necessarily follow that it will prove of equal value to the world in general, since it is difficult for anyone to write impersonally on such a subject as a practical course of any branch of science. An author is always apt to emphasise the points that seem to him to be the most important, and his book is more than likely to invite criticism from people who do not agree with the emphasis. Dr. Cameron is primarily a pure chemist, and thus is inclined to regard the chemical work as being the most important part of the course. We find here excellent descriptions of the tests for the elements and the tests for the organic compounds, proteins, fats, carbohydrates, amino-acids, and so forth. The book could only be followed by a student with the help of a series of lectures given at the same time, since the text contains hardly any explanations of the various manipulations and no theoretical descriptions.

The first part of the book deals with the qualitative, and the second with the quantitative and clinical procedures. A good and clear account is given of those tests on blood, urine, and foodstuffs which the authors consider to be the most useful for medical students. They have excluded more complex procedures, such as the electrometric determination of the hydrogen-ion concentration, and also all matter of purely scientific interest which is not essential for the rather circumscribed course of biochemistry which has to be crowded into the medical curriculum. The easier tests, such as the determination of urine constituents, are first described, and after these the analysis of the blood and gastric contents and the determination of basal metabolic rate, so that by the end of the course the student has had experience of nearly all the experiments which are performed on the routine specimens reaching a biochemical laboratory.

The book is much longer and more thorough than those used in most of the English medical schools, particularly the London ones, and the adoption of a course of this kind would be of great educational value.

CARE OF THE SKIN AND HAIR.

Revised edition. By WILLIAM ALLEN PUSEY, M.D., Professor of Dermatology (Emeritus), University of Illinois. London: D. Appleton and Co. 1929. Pp. 182. 5*s*.

IN this little manual one of America's most famous dermatologists has brought together all that the layman and his feminine dependents need to know for the study and care of their complexions. The discouragement of useless fads is the prime object of the book, and it is certain that if all those who contribute towards the 300 millions which, according to another American writer, are spent annually on cosmetics in that country, were to read and mark its contents, there would be a sensible reduction of this gross extravagance. The exposition of the subject is concise—at times epigrammatic. "The only practical way to feed the skin is through the stomach" should explode the most popular of the beauty specialists' many slogans, and every physician will agree that "moles of all things should be left alone by the inexpert."

Three useful diagrams illustrate the microscopic structure of the skin described in the first chapter. The following chapter explains the normal cutaneous functions, and the next two are devoted to the care of the general health in relation to these. Water and bathing, soaps, powders, creams, and physical methods are discussed in an easily comprehensible way in the succeeding sections, and Chapters 8, 9, and 10 contain an elementary consideration of the simpler inflammatory disturbances and common defects of the skin. The final two chapters deal with baldness and other defects of hair growth. The author's theories in explanation of the former can be summarised by attributing it to a "transitional stage in man's evolution." Man no longer uses his hair for protective purposes; he wears a hat, but he cannot save what hair remains by discarding his headgear. It is too late for that. "We are a result of our ancestors, and to save our hair we would have to discard the hats of all our ancestors for scores of generations back." This pessimistic view is unfortunately supported by Jackson and White's statistics, which demonstrate that baldness is hereditary in 30 to 40 per cent. of the cases.

HUMAN CONSTITUTION.

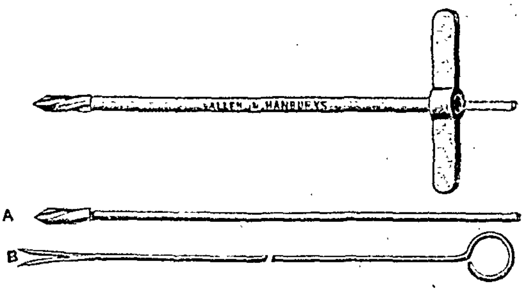
Disease and the Man. By GEORGE DRAPER, M.D. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1930. Pp. 270. 12*s*. 6*d*.

Dr. Draper is spreading his activities too widely. He showed us some time ago that susceptibility to various diseases could be inferred from measurements of the body; that objective anthropometry could identify the constitutions which were particularly liable to develop pernicious anæmia, gastric ulcer, gall-bladder disease, or tuberculosis. In this way he opened up again the old and neglected field of man's constitution as an important factor in preventive medicine. We hoped that he would extend his inquiries along these lines and that other institutions than the New York Presbyterian Hospital would take up the measuring of their patients on the large scale necessary for the confirmation of Dr. Draper's first results. Unfortunately, he has widened the scope of his inquiry, and the present volume is a loosely written collection of chapters dealing largely with a rather nebulous psychology. We wish he had stuck to the dull routine of the callipers and scale; he would have been more convincing and at least as interesting.

New Inventions.

NEW PATELLA DRILL.

THICK rope silk is a very efficient and reliable material for the suture of a fractured patella, but it is not easy to apply the silk with ordinary instruments. To facilitate this operation I have had an instrument made which renders the procedure comparatively simple. The instrument here illustrated consists of a drill and cannula, the feature of which is that the drill is a little larger than the cannula, and so goes through the bone easily, taking the cannula with it. The upper fragment is drilled just above the fracture and the drill (A) pulled out, leaving the cannula in situ. The silk is then pushed through the cannula with the forked probe (B). The lower fragment is then drilled, the drill removed, and the silk pushed through the cannula in the reverse direction, the two ends being tied together. The instrument can be used with the ordinary mechanical drill fitted with a chuck, and works very satisfactorily.

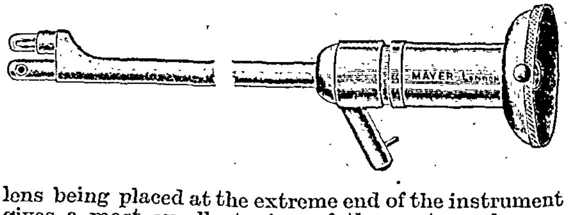


Messrs. Allen and Hanburys, Ltd., Wigmore-street, London, W., are the manufacturers.

HERBERT J. PATERSON, M.Chir. Camb.,
F.R.C.S. Eng.

AN IMPROVED PHARYNGOSCOPE.

THE instrument here illustrated is a modification of Hay's pharyngoscope. It is very much smaller and consequently better borne by a sensitive patient and is especially useful in examining children. The lens being placed at the extreme end of the instrument gives a most excellent view of the post-nasal space and of the larynx. With the light switched on, the pharyngoscope should be introduced in the mouth, pressing lightly on the tongue to get under the arch of the soft palate; the patient should be told to close his mouth and breathe through the nose so as to bring the soft palate forward.



Messrs. Mayer and Phelps, 59–61, New Cavendish-street, London, W., are the makers of the instrument.

E. E. BURNIER, M.D. Lausanne, M.R.C.S. Eng.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 8, 1930.

THE TEACHING OF MIDWIFERY.

Each generation finds it difficult to appreciate the outlook of its predecessors, immediate or remote, and it is peculiarly hard for us to see any excuse for the neglect of the teaching of midwifery, which extends almost into our own time. In his Lloyd Roberts Memorial Lecture, delivered last November, and now reprinted with additions,[1] Dr. Comyns Berkeley has made a serious indictment of the General Medical Council, the examining bodies, the universities and other teaching schools for this neglect of midwifery. He shows how little the obstetric teachers of an earlier generation, even with the help of the Obstetrical Society of London and of other professional organisations, were able to carry with them the existing powers that in their efforts to secure proper clinical training and an obligatory qualifying examination in a subject that bulks so largely in the work of the family practitioner. The mere fact that midwifery had no place at all in the medical curriculum before the Medical Act of 1886 is startling when it is realised that the date is recent enough to allow some of those in practice to-day to have qualified before it came into force. Doubtless the apprenticeship to a general practitioner, a custom with much to be said in its favour, helped to fill up the gaps in the curriculum, but curious anomalies of that time still exist. The General Medical Council has rarely had more than one obstetric teacher among its 40 members, even since training and examination in midwifery was made compulsory and took its place alongside medicine and surgery in the student's curriculum. The Committee of Management of the conjoint examinations of the Colleges has never included a representative of midwifery, although that subject has formed the third division of the final examination for over 40 years. The wonder is that a College of Obstetrics did not arise years ago, instead of but the other day.

The difficulties in providing adequate clinical training in midwifery are considerable, both from the side of the teachers and the medical schools; as Dr. Berkeley points out, the task of convincing their medical and surgical colleagues of their need for more beds and a larger share of the student's time, if he is to be properly equipped for the work of general practice, has hitherto been beyond the power of the obstetricians. The shortage of beds is reflected in the loose way in which candidates are signed up for the examination; the certificates of the training schools are irregular to a degree considered by Dr. Berkeley almost to bring them into the category of forgeries. The figures obtained from the various teaching hospitals (given in an appendix to the paper) show that in London, for instance, the number of cases allotted to medical students averages 14·5, and in some cases 12·7, instead of the minimal statutory 20. In ten London hospitals with medical schools there was a deficiency of 3628 cases for the students they trained, whereas the pupil midwives trained in London had an excess of 7856 cases over the number necessary to provide the 20 demanded by the Central Midwives Board, and but a fraction of these women will practise midwifery. The absurdity of the medical practitioner obtaining less clinical training than the midwife to whose assistance he must go in cases of difficulty is too obvious to call for comment. Dr. Berkeley would increase to 30 the number of cases in which the medical student personally attends delivery, and he would like the General Medical Council to stiffen the required certificates by demanding a type of schedule similar to that adopted by the Central Midwives Board, which includes spaces for the name of the patient, her address, and the date of her delivery, so that it is possible to check the allocation of cases. To facilitate this he would make the poor-law hospitals the chief training ground for midwives and ask the London County Council, for instance, to set aside one of its hospitals of 400–500 beds for their training—and incidentally for a centre of pathological and biochemical research. It is here that Dr. Berkeley's scheme differs fundamentally from that of Mr. Donald Roy, who contributes his reflections to the last issue of the *British Medical Journal* (p. 212). If the medical practitioner and the midwife are to work harmoniously together—and it is in this coöperation that he sees hope of improvement in the maternity service—their training should instil into them the wish to coöperate. Should it be accepted, as he believes, that the good and true tradition of conservative midwifery is to be found at its best in the lying-in hospitals of London and other large centres, progress lies not in excluding the pupil midwife because her keenness filches away from the medical student the bulk of the cases, but in extending the clinical material at these hospitals, if necessary by attaching poor-law beds, and letting the pupil midwife act as monthly nurse for the medical student's cases during the period in her training when she is not herself taking cases. The medical student would then see the midwife's rôle clearly defined. While learning to appreciate and trust the midwife, he would also learn when, where, and how to take over control of a case himself.

The problem of fitting an adequate clinical training in obstetrics into the medical curriculum is one of time as well as of place and personnel. Dr. Berkeley has come to regard six years as its minimum duration, a period now prescribed by most of the great medical teaching centres in the world and even exceeded by some, the longest being nine years in Sweden. In such a programme infant welfare and hygiene are regarded as part of postnatal supervision and complementary to midwifery; the recommendations of our General Medical Council to this effect have remained until now a dead letter. The important place of pædiatrics in the work of the family practitioner also necessitates additional clinical provision for it in the curriculum. Six months at least would be devoted solely to obstetrics and gynæcology, of which four should be allotted to midwifery with its ancillary services of prenatal and postnatal supervision and infant welfare, and two to gynæcology—the common minor ailments rather than the details of operative technique. Of this time two months, preferably more, should be spent in residence at a lying-in hospital or maternity department with at least 50 beds. To these and the many other constructive suggestions made by the Lloyd Roberts lecturer all interested in medical education should pay heed.

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[1] Manchester: Sherratt and Hughes. Reprinted for private Circulation from the Journal of Obstetrics and Gynæcology of the British Empire, 1929, xxxvi., 701.

ACUTE OTITIS MEDIA.

ACUTE inflammation of the middle-ear cavity, common enough at all times, is especially prevalent at this time of year, and it is therefore appropriate to pass in brief review the salient features of this important affection. In the overwhelming majority of cases the infecting organisms gain access to the middle-ear cleft from the nasopharynx along the Eustachian tube. The inflammation is not confined to the cavity of the tympanum, but involves the whole of the tract of the middle ear; for the Eustachian tube itself, the tympanum, the antrum, and the mastoid cells are all implicated.

The infection may be caused by a great variety of organisms, but in any individual case it is usually due to one variety only—that is, an organism is obtained in pure culture from the middle ear. When perforation of the membrana tympani has taken place, secondary infection with the organisms present in the meatus can readily occur; this is believed to be the principal cause of failure of resolution and consequent chronicity, and its prevention is one of the important aims of treatment. In some epidemics of the acute specific fevers, notably scarlet fever, measles, and influenza, the infection is of extraordinary virulence, and rapidly involves the bony walls of the cavities, and produces by extension the well-known and dreaded intracranial complications. But in the great majority of cases the virulence is far less severe, the bone is not seriously affected, and the inflammation is almost confined to the mucous lining of the aural cavities. As the entire cleft of the middle ear is involved in the inflammation, it follows that in any case of acute otitis with earache, tenderness is likely to be present over the mastoid, either over the antrum or the mastoid tip, or in both situations; but at this stage such tenderness does not imply that surgical opening of the mastoid cavity is indicated. The key to the cure of inflammation of these cavities, as of most other inflammatory diseases, is free and unobstructed drainage. In the earliest stage the fluid secreted can drain down the Eustachian tube, and many cases of mild inflammation of the middle ear do drain and get well in this way. But in severer cases the tube is obstructed by swelling of its mucous lining, perforation of the membrana tympani occurs, and drainage by this route with subsequent healing results. Sometimes, again, there may be a block at the aditus, or at the neck of a mastoid cell, or group of cells, with the result that the mastoid becomes surgically involved.

These facts should form the basis of the treatment of all inflammations of the middle ear. In the mildest forms, with little or no pain, but with a feeling of fullness and some impairment of hearing, gentle inflation with the Eustachian catheter will often re-establish the patency of the tube and hasten recovery. When earache is present the prompt use of an antiseptic in the meatus is of value to sterilise the canal and prevent secondary infection should the membrane perforate or have to be incised; a 5 per cent. solution of phenol in glycerin is frequently employed and has the additional advantage of acting as a local sedative. But when pain is severe and accompanied by fever, a timely incision of the drum membrane is the best of all therapeutic measures, and in a very large proportion of cases is speedily followed by cessation of the earache and recovery from the inflammation; there is no need to wait for bulging of the drum. This little operation is not difficult to perform, and is much more often postponed too long than done too soon, but a general anæsthetic should be given, for it causes intense pain in an acutely inflamed ear. If symptoms persist for more than a few days after free drainage of the tympanum has been established, the probable cause is obstruction of drainage at the aditus or in the mastoid cells, and a mastoid operation is desirable. In a few cases a profuse discharge continues in the absence of other symptoms; if this remains without abatement over some three or four weeks, it is probably due to partial obstruction in the mastoid, and also calls for operation in order to avoid chronic suppuration.

ASPIRATION OF DIPHTHERITIC MEMBRANE.

IT is related that on one famous occasion Stalky fulfilled his threat to get even with the Head for "a lickin' from King, 500 lines, *and* a gating," and the method of his revenge was the publication of the Head's gallantry in applying the aspiration method to the diphtheritic membrane of Stettson major, a mere day boy. Certain workers in America have been attempting to perfect a routine by which aspiration technique can be applied to diphtheria in the larynx as well as in the fauces, and without the element of personal risk which provided Stalky with his triumph. The procedure, which was initiated in 1922, is associated with the name of Dr. HARDMAN, now of the Ontario State Public Health Service, and has been gradually developed. For the last four or five years it has been used regularly in several American hospitals and references to it have appeared from time to time in the Weekly Bulletin of the Health Department of the City of New York. No paper, however, has yet appeared giving full details of the technique and an adequate statistical estimation of its value. The chief medical officer of the Metropolitan Asylums Board therefore decided to draw the attention of his Board to the desirability of obtaining first-hand information on the value of the method, and Dr. ALEXANDER JOE, medical superintendent of the North-Western Hospital, was sent out to New York to investigate it on behalf of the Board. His report, which has been published,[1] was the subject of discussion at a meeting of the Fever Hospital Medical Service Group of the Society of Medical Officers of Health last week.

The aspiration method employed at the Willard Parker Hospital, New York City, was described in detail in our last week's issue (p. 257). The apparatus required is simple and inexpensive and consists of a laryngoscope; a portable suction apparatus, run off the hospital current; a number of sterile laryngeal swabs fixed to the swab-stick by collodion and held in artery forceps; a tongue depressor; and the special brass suction tubes, which can be made for a few shillings. The American authorities recommend that none of the apparatus should be plated because of the risk of roughening or scaling of the plating after much cleaning. The patient is wrapped in a sheet and held by a nurse, while another nurse steadies the head in such a way that it hangs backwards over the end of the table with the medial plane at right-angles to the table. The laryngoscope is introduced so that it rests on the upper teeth in the mid-line, bearing on the roof of the epiglottis. After a thorough inspection of the larynx a swab is passed for direct culture, and the aspirating tube is then used once or twice as required. The operation lasts a few moments only, and—provided the operator is reasonably skilled—causes the patient no more than a little discomfort. At the Willard Parker Hospital no anæsthetic was given for its performance. It is particularly useful at the intermediate stage of membrane formation, the stage at which the patient usually enters hospital. The membrane is then readily detachable and there is little œdema and no hæmorrhage.

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[1] Metropolitan Asylums Board, Infectious Hospitals Department. Report on the Aspiration Method of Treating Laryngeal Diphtheria. By Alexander Joe, M.D., D.P.H. Office of the Board: Victoria Embankment, E.C.

The statistics available are unfortunately inadequate to provide any reasonable indication of the value of this method, but it is always true that the personal impressions of good clinicians are worth more than many volumes of figures and Dr. Joe found that the physicians in New York and Boston who had followed the progress of the work were unanimously in its favour. It is no derogation of a new technique to say that the personal element enters very considerably into its success, and Dr. Joe found that the technique is not difficult and should be equally successful in the hands of anyone with the dexterity to perform a direct laryngoscopy. It seems to be safe, and the only mishap on record is the loss of a milk tooth. Although in America it has always been used as a substitute for or accessory to intubation, Dr. Joe sees no reason why it should not be equally valuable in cases where tracheotomy is the operation of choice; indeed, aspiration through the tracheotomy tube might turn an apparent failure into a success. The introduction of diphtheria antitoxin marked such a tremendous advance in the campaign against the toxic aspect of diphtheria that the obstructive aspect is apt to be forgotten by those who do not constantly have to deal with these distressing cases. The aspiration technique, if it proves as safe, simple, and inexpensive as Dr. Joe suggests, will certainly deserve most serious consideration by all who are concerned with the treatment of croup.

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MENTAL PATIENTS AND THE JUSTICE'S ORDER.

In the Mental Treatment Bill as it comes before the House of Commons no justice's order is required for temporary treatment. It is not easy for the medical profession to form an unbiased opinion on the necessity for the justice's order before the reception of mental patients in hospitals or into private care. The welfare of the patient is the doctor's first thought, and when he is satisfied that immediate treatment is necessary he chafes at the delay that the application to a justice involves, and he sympathises with the unwillingness of the friends to make the application. When this means a revision of the case he is impatient, and resents the interference of a layman in what he considers a purely medical matter. Familiar with the procedure in infectious disease he sees no reason why mental illness should not be treated in like manner. Conscious of singleness of purpose in regard to the welfare of his patient, he is convinced that the medical profession can be trusted to discharge its duty properly. On the other hand, the sacredness of liberty is so important in the minds of those with whom the freedom of the subject is a religion, that they feel that, even if treatment be delayed in some cases, even if now and then patients commit suicide when the justice declines to sign the order, and even if the procedure is painful to relatives, yet the welfare of the community justifies the present procedure. If they are told that the recent Royal Commission found no single person improperly detained, they will reply that this is because the present procedure is successful.

In a recent pamphlet[1] by Dr. J. R. Lord the whole question of the procedure for the admission of persons suffering for mental illness is discussed. Dr. Lord would discard the justice's order and in its place substitute the approval of "a panel of approved citizens," appointed by the local authority. There would be no formal order, but the approved citizens would merely endorse the medical certificate. It is doubtful whether this procedure would satisfy the liberty-of-the-subject enthusiast, whether it would be more acceptable to the relatives of patients, or whether in practice the "approved citizen" would be in any way preferable to the magistrate. But while saying this we are grateful to Dr. Lord for directing attention to a subject that deserves serious study. Everyone with experience knows that the justice's order is really little or no safeguard against improper detention. Some justices are complaisant, taking little trouble when the parties concerned are known to them; some are so oppressed with the responsibility of signing orders that grievous delay in treatment occurs; some find the duty thrust upon them by the State so unwelcome that they rely entirely on the clerk. Incidentally the refusal of a justice to recognise a case of high-grade deficiency may and does lead to the procreation of illegitimate children. The position is often most painful when a patient under care exercises his right to see a justice after his admission. A medical officer of long experience tells us he cannot recall a single case in which this did any good, unless it be called doing good to be in a position to tell the patient afterwards, "Well you had your chance and saw the justice." All this is wrong in principle; it emphasises the detention, and ignores the medical aspect of the case.

The value of the intervention of the justice should be examined afresh by a select committee or some other impartial body. It may not be remembered that Lord Shaftesbury, who probably more than anyone in his day contributed to the reform of our mental institution, who was responsible for the passing of the 1845 Acts (often called the Magna Charta of the insane), and who was one of the first lunacy commissioners, protested to the end against the introduction of the justice, and when overridden by the Act resigned his commission. Now nearly 40 years have elapsed and the question arises whether, after all, Lord Shaftesbury may not have been right. If he was it follows that the procedure which seems now to be embedded in English law is really unnecessary and is retarding the treatment of mental disease. We are glad the Ministry takes the view that a justice's order for temporary treatment would defeat its own object.

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[1] Reprint from the Journal of Mental Science for Oct., 1929. London: Adlard and Son. 2*d.*

Freemasons Hospital and Nursing Home.—During the past year the pressure upon accommodation was so great that the staff had to be provided for in five separate buildings. The "case days" increased from 14,772 to 15,872. Large extensions are to be made at a cost of £250,000, of which £100,000 is in hand; the land has already been paid for. There were 610 in-patients during the year, 32 of whom came from over-sea.

Hospitals and Motor Accidents.—Motor accidents last year cost Altrincham General Hospital £1050. Many of the injuries were sufficiently serious to necessitate prolonged stays in the hospital. In the three months ending with October last the motor accident cases treated at the Royal United Hospital, Bath, numbered 21 in-patients and 26 out-patients. The in-patients remained for a total of 235 days at a cost of £91, of which £1 7*s.* 6*d.* was repaid.

Annotations.

"Ne quid nimis."

THE INTERNATIONAL CONGRESS OF MENTAL HYGIENE.

THE National Council for Mental Hygiene is acting in Great Britain as a liaison body in regard to this Congress—the first of its kind—which is being held in Washington from May 5th to May 10th. The Study Tours Sub-Committee of the Royal Medico-Psychological Association have now organised a study tour in the United States in connexion with the Congress, and prompt applications are invited from those who propose to attend the functions. A United States correspondent has already described the activities on the other side of the Atlantic (THE LANCET, Feb. 1st, p. 260), from which the intention to make the occasion an important one can be gathered. Attendance at Washington is not limited to members of particular organisations or to official delegates, but affiliation to the Congress is open to all interested in mental hygiene, while members of the Royal Medico-Psychological Association will be able to participate in the Tour projected to take place before the Congress. Those doing so will visit, as a party, representative American institutions, and obtain an opportunity of familiarising themselves with the practical as well as the scientific aspects of American psychiatry under advantageous conditions, economical and otherwise. Copies of the programme of the Congress and Tour, and forms of application, can be obtained from the Secretary of the National Council for Mental Hygiene, 78, Chandos House, Palmer-street, London, S.W. It will be a great convenience if those who wish to attend the Congress would send their names and addresses at once to Dr. J. R. Lord, Horton House, Epsom, while those who are members of the Royal Medico-Psychological Association should communicate with Dr. A. Edward Evans, 3, Rotherwick-court, Golders Green, N.W., who is acting as hon. secretary of the Study Tours Sub-Committee. Decisions to join the party should be made at once, as reservations for berths and hotel accommodation are limited. The travel arrangements are in the hands of Messrs. Thomas Cook and Son, Ltd., and intending delegates will receive every assistance by communicating with the head office of that firm, Berkeley-street, London, W.

AN UNUSUAL EPIDEMIC OF DIPHTHERIA.

THE January number of the *Journal of Hygiene* contains an instructive account of a diphtheria outbreak in New Zealand. It appears that in a certain small township the attack rate for diphtheria was, in 1926, equivalent to about 30 years of the London endemic. This high morbidity was attributed to the "unsalted" condition of the community. The cases occurred in two distinct groups, and all the circumstances suggested that the majority of the earlier set of cases contracted the disease by means of droplet infection in the local school. The later group were infected by milk, and the incidence fell chiefly on pre-school children and adults, presumably because the school age group had been partially immunised by the preceding air-borne outbreak. The epidemic afforded an opportunity of making some exceptionally interesting observations on Schick immunity and the rate of artificial immunisation. At the time of the first outbreak samples of the children were Schick tested, and those who reacted were given a course of toxin-antitoxin mixture. Owing to the inadvertent use of a deteriorated Schick toxin, many children, who would have reacted to a fully potent toxin, were falsely recorded as immune, and were not given prophylactic inoculations. When the second outbreak materialised there were two groups of children—those who had had prophylactic inoculation and those who had not—and it was noted that the incidence of diphtheria among the inoculated group was not significantly different from that of the total community. This disappointing result was, however, explained when a second series of Schick tests, six months after the first, showed that 72 per cent. of the presumably protected children had failed to acquire active immunity. The failure of the prophylactic course to induce immunity in the majority of those who received it is attributed to the lack of diphtheria experience in rural as compared to urban districts; it was found that in the orphanages of Dunedin city 100 per cent. of the Schick susceptible children acquired immunity within four months, with the same prophylactic course that failed so conspicuously in the unsalted rural district. This observation points the practical lesson that the more unseasoned a community, or the higher the original percentage of susceptible Schick reactors it contains, the more intensive must be the prophylactic course if it is to be successful in inducing active immunity against diphtheria. Because of these and other lessons this New Zealand epidemic deserves the careful consideration of epidemiologists.

A DECLARATION OF FORMULAS.

THE technicalities of the Medicine Stamp Acts and of their administration have rendered possible a new development, the implications of which are of wide interest, in the large-scale manufacture of proprietary medicines. There is reason to suppose that the first English nostrums of which we have any record were not secret remedies. Thus we find George Wilson, the chemist whose aqua mellis was supplied to James II., advertising proprietary and other remedies in 1686 with the invitation: "And at all times a Free and Welcom access to see any of those Medecines you shall have of me, prepared from the beginning to the compleating of the same." And there is in the Public Record Office a letter from Dr. John De la Bere, of Christ Church, Oxford, dated March 23, 1596/97, containing the passage: "Those Specifica medicamenta, wh were promysed to be p'pared for me, by your London Chymyst, I could never obtayne. Wherefore . . . I am forced now to bylde a Laboratorie or Styllhouse of myne owne . . . ." Secrecy was at first, not improbably, a weapon against unscrupulous competition; but secrecy had the manifest drawback of becoming, in some circumstances, indistinguishable from quackery. The first Medicine Stamp Act, passed in 1783, taxed secrecy except when secret remedies were sold by persons who had served "a regular apprenticeship to a surgeon, apothecary, druggist, or chymist." The principal Act now in force, that of 1812, does not perpetuate this comprehensive exemption, but lays on vendors the onus of showing a remedy to be "known, admitted, and approved" as the condition of sale unstamped. Reduced to its simplest terms, the relevant clause provides that such remedies shall not be the outcome of "any occult secret or art," shall not be associated with an exclusive right of manufacture, shall not be patented under the Great Seal, and shall not be held out as nostrums or as specifics. In practice, the Board of Customs and Excise, the administrative authority, requires a declaration of formula either on the label of each unstamped medicine or in an approved book of reference. The remaining obstacle, that of trade-mark rights, is surmounted by registering a trade mark for a series of articles and not for a single medicine. Such remedies can be sold unstamped by chemists (including limited companies carrying on business under Section 3 (4) of the Poisons and Pharmacy Act, 1908) and by the small class of other persons who have served a "regular" apprenticeship. Vendors not so qualified must take out a patent medicine licence. Until the last few weeks this exemption has only been used on any considerable scale in respect of medicines the composition of which was easily deducible. Now, however, manufacturers of proprietary medicines extensively sold have begun to avail themselves of the exemption in one of the two permitted ways. The departure is of interest in that such medicines are no longer secret remedies—though a casuist might argue that they remain secret when sold stamped. As a matter of fact, it has long been the rule in various Continental countries that all imported medicines must bear a declaration of formula; and in this way analysts and other people interested have easily come to know the composition of remedies that in this country have been regarded as secret. Some years ago we printed[1] a number of formulas of British and American specialties as disclosed to the Italian customs authorities by the makers themselves. A long way has been travelled from the state of things familiar in the early years of the eighteenth century, when arcana were advertised as obtainable "at the author's house." The proprietor or part-proprietor of the modern "nationally" advertised medicine may well be a man of high education who in his heart despises secrecy and is quite willing to let the world know his formula, confident that his long experience in turning out a particular compound will ensure its predominance in a more open market. Obviously the disclosure of the formula should in every case be complete; a mere list of ingredients will not suffice. It remains to be seen to what extent the principal manufacturers of proprietary medicines will decide on disclosure, and what the effect will be on the revenue from medicine stamps, which has averaged for the past ten years about £1,300,000 annually.

UNITED STATES ARMY MEDICAL EQUIPMENT.

IF nations were consistent in their preparations for war they would observe just as much secrecy over advances in military medicine and equipment as they do over a new gun or submarine. But fortunately for our faith in humanity they do not carry these matters to their logical conclusion and any advance in the technique of treating battle casualties is published to the world at large. The Wellcome Prize for research in this field has been won for 1929 by Major J. P. Fletcher, of the United States Army Medical Corps, for his report on the Army Medical Department's Equipment Laboratory, and the work done there since the war.[2] The scope of this work has been very varied, and some 37 different articles of equipment have been considered, the most important among which were first-aid dressings; individual equipment for medical, dental, and veterinary officers, N.C.O.'s, and privates; standard medical field containers; a metal litter for airplane and trench use; types of ambulance bodies; a collapsible two-wheeled litter cart and heaters, lighting sets and laboratory equipments for field hospitals. Major Fletcher says that whenever a proposed model is considered certain factors have to be borne in mind. These are: possibility of production in quantity; availability of material in time of war; replacement of breakage; cost as compared with utility and time, weight or space saved; simplicity and "fool proofness"; applicability of the device to additional uses. After exhaustive tests by the laboratory and in the field, the model has to be passed by the Medical Department Board, and any other arms of the service which may be interested in it. Under such searching conditions, about 70 per cent. of models are rejected. As regards first-aid dressings there were five of these in use in the U.S. Army at the end of the war. These have been reduced to two; a small, which is a five by seven inch gauze-covered cotton pad attached to a four-tailed bandage, and a large, which is approximately 12 inches square, but otherwise identical. The application of wheels to a stretcher is obviously desirable, but the two-litter carrier evolved during the war for traction by men or behind an ambulance proved unsatisfactory. The laboratory have designed a two-wheeled cart which can be clamped on to any standard army litter. This cart weighs 70 pounds, and is mounted on small rubber tyred "buggy" wheels which can be folded with the wheels parallel to the axle, to be hung on the back of a vehicle. It is claimed that tests have shown that evacuation of wounded can be greatly speeded up by its use. A considerable advance has been made in ambulance design. During the war two types were found to be required, a light Ford type for front line work, and a larger type for use in convoys. The war-time three-litter Ford type has been developed into a four-litter body on a passenger car chassis, the whole ambulance so light that it can be lifted bodily by 14 men. The old four-litter heavy type mounted on a standard one-ton truck chassis has been changed to a six-litter body weighing less than the original pattern, and with the driver's seat completely enclosed in glass. This body will carry six lying cases or twelve sitting cases and one lying case, or six sitting cases and three lying cases—in other words, there is an all-round increased carrying capacity of 50 per cent.

HÆMATURIA CAUSED BY INHALING TURPENTINE.

A RECENT outbreak of hæmaturia on one of H.M. ships appears to have been due to inhalation of turpentine vapour by seamen engaged in painting in enclosed spaces. Surgeon-Commander H. Wilks[1] reports that symptoms arose after one or two days' work, seven men reporting themselves sick within a week. The patients complained of scalding pain at the end of micturition, and, in some cases, of frequency; the urine contained blood and had the violet odour associated with turpentine poisoning. The hæmaturia disappeared spontaneously and rapidly in hospital, and showed no signs of recurrence on return of the patients to work. The turpentine used was analysed and was reported by the Government analyst to be good and normal. To prevent further cases, the parties of seamen engaged in painting were cut down and distributed at greater distances from each other, and orders were given for removal of paint from hands and faces before eating. No more cases arose after the parties had been thinned out. There is a possibility that the turpentine used was insufficiently mixed with the flatting, for the seaman responsible for this task was hard put to it to keep pace with the demands of the painters. The vapour of the turpentine was therefore more quickly released than it was removed by the ventilation system.

THE BARGEE'S CHILD.

WHILE the slums of London continue to advertise on a large scale the effect of overcrowding on child life, it seems curious to bewail the lot of the few children living on barges. Lieut.-Colonel Fremantle, during the debate on the second reading of the Canal Boats Bill on Jan. 31st, estimated the number of these children at 3000, and said that of these only 1000 were receiving no education. Further, though the sleeping quarters on canal boats are confined, ill-ventilated, and overcrowded, and the sanitary arrangements are usually primitive, there is no evidence of a lower standard of health among barge-dwellers than among town- or country-dwellers of the same class. In point of fact, the bargee lives less in the cramped cabin than the average cottager lives in his house; it is difficult to persuade a normal child to stay indoors; it must be almost impossible to prevail on him to stay in the cabin of a barge. But while the London slum child plays in the street, the child of the barge plays in fresh air on the deck or banks. Eight hours in overcrowded sleeping quarters have thus to be set against the remainder of the day, which is spent in the

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[1] THE LANCET, 1924, i., 256.

[2] Military Surgeon, December, 1929.

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[1] Jour. Roy. Nav. Med. Serv., January, 1930, p. 53.

open air. Certainly, should the child fall ill the conditions are highly unsuitable both for nursing and for adequate medical care, and early removal to hospital is the only remedy. That the children take part in the work of the barge is not surprising; but there is no reason to assume that the bargee, who (apart from a notable but possibly mythical vocabulary) does not differ from other men, is likely to make his children wretched by overworking them. The difficulty of educating these children certainly calls for thought. A canal-boat school, as Mr. Harry Gosling explained when moving the second reading of the Bill, has all the disadvantages of a canal boat and few of the advantages of a school. The children attending would be educated among themselves with no possibility of mixing with other children, and the damp quarters, absence of playgrounds, and of sanitary arrangements make such a school most undesirable. Even so, it seems a drastic measure to try to combat these disadvantages by making it illegal for children to be on such boats. If this is done the mother will be forced to set up house on shore with the children, and family life will at once come to an end. Though it has been suggested that the absence of women from the boats would entail addition to the crews and hence increase in cost of transport, Mr. Gosling is of the opinion that reconstruction of canal boats should prevent this. He went on to describe the difficulties of childbirth on a canal boat, with inadequate preparations and in the presence of most of the family. Granted that this is extremely undesirable it occurs with great frequency in any slum district, and is not peculiar to barge life. The problem of overcrowding is fundamental, and not to be cured by removing children from barges. Canal boats used for the removal of house refuse, however, are certainly an unsuitable environment for the upbringing of children, and the public should be able to learn what proportion of canal boats are used for this purpose and whether the same boats perform this function continuously or intermittently. That children do live on such barges at present is proved by the reports of the Ministry of Health inspectors; the report of the Public Cleansing Committee also discusses the matter, and recommendations were made by the inspectors that children should not be allowed to live on refuse barges. While no medical man would fail to support such a suggestion, many will hesitate to agree to the wider application implying the de-barging of all these children.

PSITTACOSIS IN GERMANY.

FURTHER information is now available about some of the German cases of psittacosis to which our Berlin correspondent referred on Jan. 25th. Writing from Hamburg, Prof. C. Hegler[1] describes two small outbreaks, one of which involved three members of a family which traded in animals and the other some of the staff and patients of the St. Georg Hospital. The clinical picture in all the nine cases was, he says, surprisingly uniform, and included pneumonia. The bacteriological findings were negative, although a special search was made for *Bacillus psittacosis*, and Hegler thinks that the disease may be due to a filtrable virus acting, perhaps, in combination with bacilli such as pneumococci and streptococci which happen to be present. The isolation of such a virus was reported in our last issue by Bedson, Western, and Simpson. Prof. H. Embden and Prof. G. Adamy[2] describe 14 cases observed in the general hospital at Barmbeck. All the patients manifested symptoms similar to those of the English cases, and the bacteriological findings were all negative. Dr. G. Elkeles[3] contributes an account of an outbreak last November in a Berlin household, a member of which had brought back from the Upper Amazon four birds, three of which were very ill. With one exception, all those living in the house fell sick; two died and three narrowly escaped with their lives. A friend to whom one of the sick birds was given also fell ill, but the family which received the sound bird showed no signs of illness. All the patients suffered from severe cerebral symptoms and circulatory disturbance, together with an atypical form of pneumonia without sputum. In another small outbreak the infection attacked six persons who had come into contact with a parrot. Cultures from the organs of the dead patients gave no data of ætiological significance, and investigation on the dead birds also produced no result. Elkeles does not believe that *B. psittacosis* has anything to do with the disease.

THE CONTROL OF BOVINE TUBERCULOSIS.

Dr. George Hilton[1] gives a valuable account of what has been done and is being attempted in Canada to control bovine tuberculosis. The first step in 1896 was the offer of free testing of herds with tuberculin, an offer which met with little response. In 1903 an Act was passed making it compulsory to place an identification mark (a punched T) upon all reacting cattle. No opposition is recorded, a matter of interest since such action is a very debatable and controversial matter in this country. The supervised herd plan was adopted in 1905, but made little progress. In 1914 municipalities were required to limit their milk-supply to officially tested herds, a procedure which broke down in practice owing to the refusal of many dairymen to submit to the testing of their herds, while the complaisant could not provide an adequate supply of milk. This was got over by allowing untested herds to supply if the milk was pasteurised. These measures, if their actual results were small, were certainly instructive and thus enabled the Federal Department of Agriculture to introduce the accredited herd plan in 1919. Under this plan, much used in the United States, the aim is to eradicate tuberculosis in individual herds and then maintain them free from this disease. The testing and retesting of cattle is done free of charge, and compensation is paid for slaughtered reactors upon a fixed scale. On March 31st, 1929, there were approximately 4000 fully accredited herds apart from 2000 herds in process of becoming accredited. Ancillary to this, the restricted area plan was adopted in 1922. Provided at least two-thirds of the cattle owners in any specified area sign a special petition, and this is approved by the government of the province concerned, the plan is put into operation. The object of the plan is to test all herds in a defined area as expeditiously as possible, with a view to locating the infected herds, and steps are then taken to eradicate tuberculosis in these herds, compensation being paid for slaughtered reacting animals. Compensation is only given after satisfactory disinfection of the premises. Retesting is, of course, necessary, and steps are taken to prevent the introduction of infected animals. The area plan is considered the more economical, and it promotes better housing and other sanitary conditions for the cattle. When Hilton's paper was written there were eight restricted areas with approximately 700,000 cattle. In general, these two plans have made great progress and about one-ninth of all the cattle in the Dominion have been tested at least once, while over 114,000 reactors have been slaughtered. There is an increasing demand for tubercle-free cattle and milk.

It may be pointed out that the above schemes are only practicable in areas with a low incidence of bovine tuberculosis. Hilton does not give the average incidence in Canada, merely remarking that it is comparatively low, but the procedures are nearly identical with those employed in the United States where the percentage varies from only 3 to 5 per cent. In England our rather imperfect data suggest that it is not less than 40 per cent. and in many areas considerably more; so that these American methods are really impracticable here. Notwithstanding this fundamental difference these drastic eradication methods are not without their supporters in this country. Quite recently the West of Scotland Division of the National Veterinary Medical Association has issued a pamphlet entitled "Scheme for the Eradication of Bovine Tuberculosis," which while differing in details from the American model is, nevertheless, based on the same principles.

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[1] Deut. med. Woch., Jan. 24th, p. 148.
[2] Münch. med. Woch., Jan. 24th, p. 140.
[3] Ibid., p. 139.

[1] Jour. of Dairy Research, 1929, i., 58.

It is of interest to note that Dr. Hilton's article appears in the first number of a new periodical, the *Journal of Dairy Research*, which is financially supported by the Empire Marketing Board. Lord Passfield, in a foreword, states that the journal is designed to assist dairy research workers in every part of the Empire, and is planned to include in each issue three classes of material—namely, a monograph by a leading authority on some broad question of dairy research work, detailed papers of scientific interest, and reviews and records of current scientific contributions to dairy research. There is ample room for such a publication, and if later numbers are up to the standard of the first issue it should find a large and appreciative circle of readers. The editor is Dr. R. Stenhouse Williams, of Reading, whose name will be familiar to many of our readers in connexion with his work as Director of the National Institute for Research in Dairying.

TREPANS AND TREPHINES.

FEW instruments employed in surgery at the present time have a more interesting and ancient history than the trepan. Its use dates back at least 2300 years, when Hippocrates first described the various instruments employed in his time in the operation of trepanning. Even long before this period there is evidence that prehistoric man practised the operation by scraping away the bone with a piece of sharp flint or obsidian as the bushmen of Australia and the natives of New Britain and New Ireland do at the present time. In the New World the Incas of Peru, from a period of antiquity, employed a flint with a serrated edge to remove the fractured bone, as shown in many skulls that have been excavated. The ancient Greeks used three kinds of instruments for trepanning—viz., the terebra or borer, the terebra serrata or circular saw, and the perforator, which was operated with a bow drill. The first, which had a spear-shaped point, was employed when the piece of bone to be removed was larger than could be covered by the circular terebra serrata, and was operated by means of a thong twisted round the centre or attached to a cross-beam. It was used for boring holes around the piece to be removed, and when this was done the lenticular was introduced to break through the interspaces between each perforation, and the roundel of bone then removed. The terebra serrata was a conical piece of metal with a serrated edge, shaped somewhat like a thimble, with a straight shaft rising from the top, and was operated by rapidly rolling the shaft between the palms of the hands. In this instrument we have the origin of the crown saw which the Romans adopted for their modiolus. They also employed the terebra, which they operated with a bow-drill, using a terminal with a sharp point which suddenly became broader, as described by Celsus. In the twelfth century Albucasis described an instrument terminating in a spear-shaped head called "incisoria," and a borer with a sharp point, both of which were employed in his time for trepanning; while in the fourteenth century Lanfranc alludes to a borer with a spear-shaped point called a "trepanon" for making a ring of perforations. In an interesting manuscript of the same period by John Wryghtson, an English surgeon, there is a drawing of an instrument similar in shape to the Roman modiolus with a circular saw and centre-pin, fixed to a straight handle, which was evidently operated by rolling between the palms of the hands. In the fifteenth century Bruynswyke described and figured "trepanes" terminating with a long gimlet-like screw, "to make small holes in the skull." Andrea della Croce, the Italian surgeon, in his work "Chirurgie" printed in 1573 devotes considerable space to the operation of trepanning, and describes several instruments with a brace and drill-stock, to which a circular saw or perforator could be fixed with a screw as occasion required, and the same type of instrument was used and described by Ambroise Paré.

The first mechanical trepan was described by Matthia Narvatio of Antwerp in 1575; this consisted of a horizontal beam with a cog-wheel in the centre, turned with a handle, that actuated the saws or borers, which were fixed on a straight bar with a screw. To Fabricius Aquapendente (1537–1619) is attributed the invention of the trephine, though Woodall in 1639 alludes to the trephine as "an implement of my owne composing," it was figured by Fabricius before his time. According to Savigny, "The name trephine is so-called from the triangular form it acquires by the horizontal position of its handle, in contradistinction to the trepan, in which the head or crown is affixed to a frame or brace, similar to and used in the manner of the carpenter's wimble." To Fabricius is also attributed the introduction of the trepan saw with shoulders, which prevented the instrument sinking down into the membranes of the brain; although Ambroise Paré figures a brace or drill-stock with a binding screw to fix the saw, the drum of which was straight and smooth, with a shoulder of a similar kind. Paré described "trepanes" as "round saws for cutting out a circular piece of bone with a sharp-pointed nail in the centre projecting beyond the teeth." He also figures a trephine which he says, "is most in use and the fittest, set forth by Dr. Crooke." In the seventeenth century Scultetus describes a trepan operated with a drill-stock which he calls "the handle," and also mentions a trephine with a transverse handle to which circular, conical saws could be fixed.

The eighteenth century marks a new era in the history of the instrument, during which the trephine gradually replaced the trepan worked by means of a brace or wimble. In 1739 Sharp introduced his trephine with a wide transverse handle of steel, the extremities of which were roughened so that they could be used as elevators. He claimed to be the first to use a trephine with a cylindrical in place of a conical, crown saw, with a key to remove the centre pin. Heister in 1743 says, "the moderns have a method of fastening the crown on the trepan otherwise than by screwing, but this is my way." He upheld the use of the screw and the saw with a conical crown. He also describes an exfoliative trepan, the handle and saw of which were fashioned from one piece of steel. In 1779 Petit introduced his perforator with a steel drill head, smooth and bevelled for drill edges, but the head was shorter than Sharp's. The type of instrument used at the close of the century is thus described by Savigny in 1798. "It had a cylindrical saw with a smooth drum, the barrel being inserted into the handle direct. It had fine teeth without gaps, and the pin ran into a slot in the barrel regulated by a binding screw and plate." The peculiar formation of the teeth (exactly perpendicular) was claimed to be an important advantage to the operator. "At this time," remarks Savigny, "the trepan used with a brace or wimble is now wholly laid aside in this country." In 1801 Benjamin Bell introduced his trephine with a wooden cross-bar, into the middle of which was screwed a steel key-barrel with a spring grip made to grasp a slot in the key-end of the trephine saw. The chief improvement was in the saw, which had a cylindrical smooth drum, with long straight teeth arranged in three series of nine, three gaps being thus left to let out bone dust, the forerunners of the windows in modern instruments. The prismatic was controlled by a thumb or binding screw and plate, which worked in a slot on the side of the barrel. Rudtorffer introduced a further improvement in 1817, by adding a screw button in the shaft by means of which the pin could either be raised or lowered. From that period the shape of the trephine has practically remained unaltered, although the saw has passed through many modifications. Examples of the instruments mentioned, illustrating the origin and development of the trepan and trephine from ancient times, may be seen in the Historical Section of the Museum at the Royal College of Surgeons of England, to which an excellent guide[1] has just been issued.

SPLENO-MEDULLARY LEUKÆMIA.

THE occasional association of spleno-medullary leukæmia with trauma has been noticed from time to time, and the injury has been regarded as an important ætiological feature by more than one writer. Dr. S. C. Lewsen records a new case on p. 288 of this issue and quotes a large number of other cases from literature. To these may be added one just reported by Dr. Annelise Wittgenstein.[2]

The patient, a railwayman of 42, had never been ill until one day he fell on the ground and one of his mates tripped over him. The only apparent result was a slight effusion of blood from the leg. He remained at home for a month. Soon after the injury he started to complain of pain in the foot and loss of appetite, with heavy day sweats. He suffered from general debility and lost weight. Nevertheless, he continued to work under regular medical supervision for the next four months, during which time the cause of his poor condition remained undiagnosed. He died eight months after his injury, and the blood counts made in hospital admitted no doubt of the diagnosis of myelogenous leukæmia, the only unusual feature of the case being the normal size of the spleen. The number of red cells and the hæmoglobin index were greatly reduced, the figures being 1,600,000 and 35 per cent. respectively. The leucocyte increase, as is usual in the acute condition, was moderate, the count giving only 20,000.

It proved impossible to ascertain whether the patient had substained a blow in the region of the spleen, but Wittgenstein thinks that a severe shaking, especially if combined with contusion of the abdomen and the long bones, may be enough to lead to leukæmia in predisposed persons. He thinks that the cause is to be sought in exogenous influences of toxic, mechanical, or infectious origin. The reference to "predisposed persons" seems to bring this author nearly into line with those who believe that trauma does no more than reveal a pre-existent disease. This opinion is very widely held. Prof. Salvatore Diez,[3] for instance, who lately collected 30 cases of a supposed association, came to the conclusion that they afforded no proof that leukæmia could originate from a blow.

FIRST-AID IN ELECTRICAL ACCIDENTS.

IT cannot be too widely known that electric shock hardly ever causes death outright. Dr. D. Pometta, principal medical officer of the Swiss Accident Insurance Institute, has recently given a useful résumé[4] of the various methods of treatment which will probably save the victim's life if applied promptly and patiently. Such measures should be as familiar as the first-aid treatment of the common forms of poisoning, and the practitioner living in a district where accidents of this kind are particularly likely to happen will do well to have his apparatus packed in a special case ready to take up at a moment's notice. He should put aside all other work to answer the call to an electrical accident immediately, and should be prepared to stay by the patient for several hours. As soon as the victim has been removed from the danger zone, his mouth should be freed from dirt and any other obstacle to respiration, such as artificial teeth, and clothing should be removed from the upper part of the body, preferably cut off to save time. He should be kept warm with blankets and hot-water bottles or heated bricks, but zealous assistants must be warned of the danger of causing burns. The face and chest may be splashed with water, the limbs and cardiac region may be massaged, and cardiac and respiratory stimulants such as lobeline may be given subcutaneously; but none of these secondary requirements must delay or interrupt artificial respiration—the essential treatment—for more than a few seconds. While pointing out that prompt and correct application is more important than the choice of any special form of artificial respiration, Pometta prefers the Sylvester method. Here he is in a minority, for most authorities agree with Prof. S. Jellinek[5] in recommending Schäfer's. He regards manual methods as better than mechanical, but says that apparatus may be useful to replace assistants when everyone is tired out. Carbon dioxide is a valuable respiratory stimulant, and can be given from a soda-water syphon when no cylinder is available. The syphon is half emptied and a rubber tube is attached to its nozzle; it is then inverted and the fluid is blown out of the glass tube. Gas is admitted to the patient's air passages through one nostril, while artificial respiration is maintained continuously. Unless the patient's other injuries are so severe that he cannot possibly be alive, respiration must be continued for at least five hours, and the absence of the sounds of heart or respiration or of the corneal reflex are no indication that he is dead.

Sir Thomas Legge, who retired from the position of Senior Medical Inspector of Factories in 1926, has joined the staff of the Trades Union Congress as adviser to the Social Insurance Department on the health of workers as affected by conditions arising out of their employment. His work will lie primarily in the prevention of industrial disease and disability, and he will continue by pen and word of mouth to keep the trade-union movement informed on the problems of health in industry. There is undoubtedly a still untapped source of study and research in the sickness records of the big trade-unions in this country.

INDEX TO "THE LANCET," VOL. II., 1929.

THE Index and Title-page to Vol. II., 1929, which was completed with the issue of Dec. 28th, is now ready. A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

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[1] Guide to the Surgical Instruments and Objects in the Historical Series, with their History and Development. By C. J. S. Thompson, M.B.E., hon. Curator of the Historical Section of the Museum. With a foreword by the Conservator, Sir Arthur Keith, M.D., F.R.C.S., F.R.S. London: Printed for the College and sold by Taylor and Francis, Red Lion Court, Fleet-street. 1929. Pp. 92. 2s. 6*d*.

[2] Med. Klin., 1930, i., 22.

[3] See THE LANCET, 1927, ii., 562.

[4] Schweiz. med. Woch., 1930, iv., 82.

[5] See THE LANCET, 1927, ii., 1001; 1928, ii., 314.

DONCASTER ROYAL INFIRMARY.—The report for the year ending Sept. 30th, 1929, shows that 1805 patients were admitted, who stayed for an average of 25·13 days, as compared with 23·4 days in the preceding year. New out-patients numbered 7143, an increase of 745; there were 3786 casualty cases and the attendances and treatments in the massage department were 27,416. A supply of radium to the value of £3000 has been given by Mr. William Nuttall. During the year Dr. H. J. Clarke, who has since died, celebrated his fifthieth year of general practice in Doncaster and was presented by his colleagues with a piece of plate. Dr. Clarke handed over to the hospital the balance of the Presentation Fund, amounting to £75, with the proviso that the income should be used for the purchase of a medal to be awarded annually to the best nurse of the year. The well-arranged and informative report sets out that the cost per bed was £129 8*s*. 9*d*., a reduction of 12*s*. 5*d*. The cost per in-patient was £8 16*s*. 10¾*d*., and per day 7*s*. 0½*d*.; out-patients cost 9*s*. 6*d*. The first block of the new Infirmary, containing 150 beds, with accommodation for 85 nurses and maids and the usual accessories, is approaching completion. The Doncaster Collieries Association has contributed £10,000 towards the cost.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LXII.—INTERPRETATION OF REPORTS ON LESIONS OF THE EYE.

PART II.*

IN the first part of this article I dealt with definite organisms. When questions arise on the interpretation of the results of tests, such as the Wassermann reaction or Pirquet's test, the answers are less easy. The modern tendency to rely more and more on laboratory tests and less and less on clinical experience and knowledge imposes a responsibility on the bacteriologist which is unfair both to him and to the patient. It must be reiterated that laboratory tests, no matter how reliable, form only part of the data essential for correct diagnosis.

The Wassermann Reaction.

It often happens that a patient is sent to a laboratory for a Wassermann reaction. The result is positive—and without any further consideration the patient is passed on to a V.D. department, the eye condition being labelled "syphilitic." Further consideration may prove that the eye condition is due to septic teeth and the positive Wassermann to a congenital taint which requires no treatment. It is the clinician's job to elucidate these facts, not that of the person making the test. I am not suggesting that it is wrong to treat a patient with a positive reaction as a syphilitic, but only that it is wrong to label an eye disease as syphilitic on a positive Wassermann reaction alone.

Reports on Patients with Iritis.

The interpretation of the reports on investigations designed to elucidate the cause of iritis is difficult. The causes are so many and varied that it is often impossible to say with certainty what variation from the normal is responsible for the iritis. It may be accepted that iritis and iridocyclitis are, as a rule, the result of toxic irritation due to some distant septic focus. It is, indeed, rare to examine a patient without finding some septic focus, a suspicious tooth, infected sinus or antrum, a collection of pus behind a deflected septum or septic tonsils; any of them may be the cause (and equally may not be the cause) of the iritis. There is one cause of iritis in men which should always be inquired into—viz., gonorrhœa. In women gonorrhœal iritis is extremely rare. I have never seen a case. The history of gonorrhœa, however, is not enough, and in my V.D. department all the other causes of iritis are gone into before the patient is examined for evidence of an old gonorrhœal infection. Gonorrhœal iritis seldom occurs during the acute urethritis stage of the disease, and the average time after the acute attack of gonorrhœa at which the iritis appeared worked out at 9 years in one series of 250 cases, and 14 years in another series.

Significance of Pus and Gonococci—

Having assessed the importance of any other septic foci the next step is to examine the patient for evidence of a residual gonorrhœa. Urethritis and gleet are rare at this stage of the disease, and it is only when we come to the examination of the material expressed by prostatic and vesicular massage that evidence of the original infection appears. It is quite usual to find pus in considerable quantities, but is quite unusual to find the gonococcus, and although at one time I was finding the gonococcus in 9 per cent. of the cases of rheumatic iritis sent to my department for examination, my last figures worked out at 3 per cent., due to a more critical definition as to what was a gonococcus in the slides examined. Perhaps even this is too high a percentage. The difficulty of detecting the gonococcus amongst the débris of pus cells, spermatozoa, and organisms in the smear is so great that a definite statement is rarely possible. However, when pus has been found in the prostate or vesicles, treatment has to be carried out in spite of inability to find the gonococcus in the discharge, and the condition is labelled gonorrhœal iritis. The report made on a prostatic massage will often record the finding of all sorts of other organisms, streptococci, staphylococci, pneumococci, colon bacilli, and diphtheroids. These are probably the results of secondary infections and must be taken into consideration when arranging a course of treatment. This should consist of (1) the symptomatic treatment ordered by the ophthalmic surgeon, such as atropin, leeches, hot bathing, &c.; (2) specific treatment, such as vaccines, prostatic and vesicular massage, irrigation, &c.; and (3) treatment to clear up other septic foci.

—and of Rheumatic Pains.

Rheumatic was at one time frequently applied to what we now know is often gonorrhœal iritis. Rheumatism is almost always present in the history of patients who come with gonorrhœal iritis. Considering the small percentage of cases in which the gonococcus is found it is naturally open to debate as to whether these cases should or should not be diagnosed as gonorrhœal iritis. I myself use this classification, because the cases of iritis in which I find pus in the material from the prostatic massage are the cases which react to gonococcal vaccine. The reaction may be one of exacerbation of the existing iritis, or one of rapid cure of the condition. I believe that gonorrhœal iritis is a toxic condition and that the gonococcus is not present in the eye. Dr. Eric Biddle, when he was working with me at Moorfields, made the observation that it was quite rare to find gonorrhœal iritis in patients who had clean mouths, or perhaps it would be better put that people with septic teeth were more likely to get gonorrhœal iritis than those with clean mouths. This may account for the comparative rarity of the condition in private practice and certainly one of the first things to do in treating these cases is to have the mouth attended to.

Tuberculin Tests.

The tests for tuberculosis of the eye are few, and of little real value as proof tests. The only one of any real value is the subcutaneous injection of tuberculin, with resulting focal, local, and general reaction, but this test is practically debarred from use in eye work, since it is inadvisable to risk stirring up a tuberculous eye by a focal reaction. The graduated Pirquet test, using human and bovine tuberculin, is of some value if the results are used with discrimination, although the test cannot give definite information like the subcutaneous test.

If the result of the test is taken into consideration with the clinical evidence it is of help in young patients, and in adults may be a useful guide as to the type of tuberculin to use in treatment. The presence of a positive Pirquet test does not mean that the eye condition is a tuberculous one.

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HOSPITAL COÖPERATION.—As the result of a Conference of representatives of the voluntary hospitals in the County of Durham a committee of ten was appointed to join with a similar number of members of the medical staffs of those institutions to meet the Durham County Council to discuss questions of hospital service arising out of the provisions of the Local Government Act.

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Special Articles.

RADIUM THERAPY.

AN ACCOUNT OF A VISIT TO THE RADIUM INSTITUTE OF PARIS.

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I HAVE just concluded a six months' visit to the Radium Institute of Paris, during which period I served as *stagiare* or clinical assistant in the different departments. A few days sufficed to show me why this Institute has gained such a high international reputation for itself and its workers. Here was the opportunity to see and later assist in the treatment of patients, mostly suffering from cancer, by surgery, radium, X ray therapy, or combination of any of these methods, as appeared indicated for each case. Here were patients consulting for advice, not at the surgical, radium, or deep therapy department, but at a clinic in which each department was represented. Each patient thus received the benefit of advice, entirely unbiased, as to what was considered the best line of treatment. Having been detailed to the appropriate department, the patient now had the benefit of coming under the care of a specialist in radium therapy, X ray therapy, or surgery, as the case might be. Some cases required more than one specialist's care, the preliminary examination by each deciding the details of the conduct of the treatment. In the follow-up clinic for treated cases the presence of representatives of all three departments encourages in each an appreciation of the possibilities of the methods of his colleagues. The biased opinion which often results from ignorance of the other side of the problem thus tends to become eliminated.

My visit has convinced me of the absolute necessity for specialisation of a large number of medical men in the field of radium therapy. Without such specialisation, and as long as radium therapy is practised widely by those whose ignorance of its limitations and dangers is equalled only by their enthusiasm to wield this new-found weapon against cancer, radium is merely a menace to the safety of those sufferers to whom it is applied in an attempt to cure. The main line of advance in the treatment of cancers by radium on the continent has been by the evolution and perfection of surface therapy, which has now superseded radium-puncture and the implantation of seeds, the methods popularly used in England to-day, as being the method which most nearly gives the ideal irradiation, uniform and homogeneous, by highly selective gamma rays. The lack of large quantities of radium has long held in check the possibility of exploring widely this field of radium therapy in this country.

With the creation of the National Radium Fund, which has reached nearly £300,000 and the appointment of a Commission to deal with the purchase and distribution of radium, the time has come when the importance of this line of radium therapy must be realised to the full if radium is to be utilised to the best advantage, and, more important, if patients are to receive what is due to them, the best and most effective treatment available. Surface therapy requires an entirely different equipment to that demanded by radium-puncture. The present tendency to put up all radium into small needles of varying lengths and charge, of varying filtration, usually 0·5 Pt. wall or less, though it produces a supply of radium very well suited to radium-puncture, also renders the same supply ill-adapted to surface therapy. It therefore seems justifiable at this juncture to put forward a plea for the serious consideration of the merits of surface therapy, and the setting aside of a considerable proportion of the radium to be purchased for the country for the purpose of testing its efficacy over a reasonable period, on suitable cases, in large enough numbers to form definite conclusions as to its superiority or not over radium-puncture.

The Commission has already shown great judgment in testing out "bomb therapy" on similar lines. Bomb therapy is only a modification of surface therapy demanded by the weight of the heavy lead protection required to protect patient and personnel from the rays emitted by the large charges utilised for treating deeply seated growths. Whilst the bomb of four grammes has but limited scope, owing to its fixed size, shape, and charge, surface therapy from which it has evolved has a very wide scope. It consists essentially in the formation of small radiant surfaces, of varying size, shape, and distance from the skin or mucous membrane to which it is moulded, which can be made to produce a very uniform and homogeneous irradiation of tumours at different depths by variation of distance of application and charge of radiant surface. Prof. Regaud and his collaborator, Dr. Lacassagne, have in recent lectures here and in America given a clear account of the evolution and growth of radium therapy, the underlying principle governing its use, their ideas on such matters as radio-sensitiveness and radio-resistance. It is my intention merely to mention briefly the methods I have seen applied to three sites of cancer—namely, the tongue (including floor of mouth), the skin, and the cervix uteri. Space does not permit details, and I am avoiding the error of mentioning average doses, except in the case of the uterine application, where doses vary less than in other sites.

GENERAL PRINCIPLES OF TREATMENT.

Certain general principles are applied at the Radium Institute of Paris, whatever be the site of the lesion or the status of the patient.

1. *Selection of Cases.*

(*a*) Elimination of patients in whom distant secondary deposits in the viscera and elsewhere are suspected on clinical and special examination.

(*b*) Elimination of those whose general health is such that they would not support the severe treatment necessary for cure without grave danger to life.

(*c*) Concentration chiefly on those cancers which react most satisfactorily to radium and X rays. Such are at present the epithelial cancers of epidermic origin, arising in the skin or mucous membranes covered by stratified pavement epithelium; certain sarcomata; some cancers of the prostate and breast.

(*d*) Elimination of all cases who have been previously treated by radium or X rays by other private clinicians or at institutions, unless they bring or can produce a statement of dosage received and details of treatment.

The importance of this rule cannot be over-emphasised. A vast experience of the radiotherapy of cancers has convinced these workers of the importance of taking strict precautions against the rule being broken, save in exceptional circumstances. They believe that a cancer, once treated by radiotherapy, becomes resistant to further irradiation. At the same time the normal tissues become more sensitive to rays after a previous irradiation. Each subsequent treatment will have to be more severe in order to overcome the more resistant cancer.

A second, and, still more, a third or a fourth treatment, whilst standing a poorer chance, therefore, of curing the cancer than would have done the first treatment, becomes more and more harmful to the normal tissues. Too often, in such cases, cure of the cancer is bought at the price of an extensive necrosis of the normal tissues, the production of which is as often as not as dangerous to the patient as was the cancer itself.

2. *A Preliminary Biopsy.*

This is required in every case, and the report received before treatment is commenced. *In certain* cases biopsy has to be omitted for obvious reasons, either till operation, or altogether, but these cases are exceptional. Biopsy is usually performed at the first out-patient consultation.

3. *Single Treatment.*

The belief in the gradual vaccination or onset of radio-resistance of irradiated malignant tissues to the further action of rays has led to the recognition of the necessity of giving the whole treatment within a comparatively short period before this complication has time to make itself seriously felt. A treatment which aims at being curative should, therefore, be complete within about three weeks. The single *treatment does not infer that only one technique* shall be utilised. One technique may follow another, but all should be complete within the stated period.

4. *Dosage.*

Although experience has taught that some varieties of cancer are more sensitive than others to irradiation. yet it is considered preferable at present to treat all cases by the biggest dose compatible with the health of normal tissues, until research has given more certain data on which dosage can be based.

The physical dose is measured in millicuries destroyed, and all radium tubes are designated according to the hourly destruction of radon which the radium content is responsible for. As none of the tubes represent an hourly destruction of more than a fraction of a millicurie, they are designated in terms of microcuries (1/1000 Mc.) destroyed per hour. The standard tubes used represent 100, 50, and 25 microcuries destroyed per hour (ucdh), or 13·3 mg., 6·6 mg., and 3·3 mg. radium element. The filtration is 1 mm. Pt.; exceptionally, in a few special tubes, 1·5 mm. Pt.

All radium-puncture is performed with radon, utilising hollow needles of 0·5 Pt. wall, 25 and 35 mm. in length, usually containing 1 Mc. per cm. active length, as initial charge.

Whether *radon or radium be used, the dosage is* exactly comparable, both being given in terms of Mcd., an advantage lost when such terms as mg. hrs. and mc. hrs. are employed.

The biological dose which is much employed in surface therapy is the epidermicide dose—i.e., that dose which produces a selective action on the basal cells of the epidermis, producing a "chute" of the epidermis, without damage to the dermis; the approximation of the intensity of irradiation received by the deepest part of a tumour to the intensity at the skin level is aimed at in surface therapy by so increasing the distance of the source from the skin and correspondingly increasing the charge that the falling off in the intensity between the skin and the tumour is not sufficient to prevent the dose to the latter being lethal. By producing always a chute of the epidermis, one thus ensures that the malignant cells, usually considerably more sensitive than the basal cells of the skin, shall also receive a lethal dose if the distance of the radiant surface and other factors of application have been rightly estimated. It seems superfluous to add that increase of the distance of application does not increase the penetrating power of rays, as I have seen stated.

5. *The Time Factor.*

At the Radium Institute much importance is attached to this factor. Five to ten days is the usual duration of treatment employed in most of the techniques utilised for reasons which are well known. The realisation of the fact that amongst malignant cells those in a state of division are more sensitive than others, and that all do not divide simultaneously, has led to the adoption of a longer exposure to a smaller charge of radium, which has proved more effective in sterilising cancers, at least in the case of the squamous cell carcinoma, whilst being less harmful to the normal tissues.

6. *Homogeneous Irradiation.*

Improved results of radium therapy have resulted from the gradual increase of filtration, suppression of beta radiation, and even the softer gamma rays where feasible, avoidance of secondary radiation by secondary filtration, and improved methods of distributing the selective gamma rays uniformly throughout the malignant tissue.

Radium-puncture, once much in vogue, has given way to surface therapy, except in a few situations where it remains still the best method at present; such situations are the tongue, uvula, certain cancers of the breast, and deeply infiltrating skin cancers. These small needles, whose walls fail to exclude all the beta rays and soft gamma rays, with their weak charge, whose intensity of irradiation, strong immediately around the tube, falls off very rapidly away from the source, require very careful introduction into an easily accessible tumour to render success at all likely. The near presence of bone contra-indicates their use in many situations, owing to the damaging effect of primary and secondary beta caustic rays. This technique has, therefore, a limited use at the Radium Institute of Paris.

TREATMENT OF SPECIAL LOCATIONS.

Cutaneous Epitheliomata.

The method of *moulded plaques of Colombia* paste of variable size and thickness is in general use for epitheliomata occurring on the skin and accessible mucous membranes, such as the inner surface of cheek and floor of mouth. The general principles remain the same in whichever part of the body the application is made.

The area to be treated, usually allowing ½–1 cm. outside the areas of clinical invasion, is marked out accurately with skin pencil, and a layer of paste, softened in warm water, applied with the firmer, woody surface next to the skin. When moulded it is dipped in cold water to set, reapplied, and the area marked on the skin projected on to the wax surface. This area is *carefully measured in* square centimetres. *The dose* required to sterilise a cancer depends on the area to be treated and the depth of infiltration. The thickness of the paste is in relation to the depth of the lesion, but the charge required to produce the *chute* of the epidermis varies not only with this, but also in relation to the total area, and the surface, whether convex or flat. These factors influence to a great degree the amount of cross-fire occurring; cross-fire increases with increase of area, increase of distance, and increase of convexity, and is minimal when the area, thickness, and convexity are small. The dose is ordered in terms of Mcd. per $cm.^2$; the total dose thus arrived at, and the number of days during which the apparatus is to be worn (4–7) being decided, the apparatus is charged with radium tubes of 1 mm. Pt. wall, of such charge that good distribution of tubes is acquired, and the number of hours a day during which it must be worn is calculated. The radiant surface so formed being covered with another layer of wax, it is strapped in position on the patient for the requisite time per diem.

Many patients whose lesions are conveniently situated can be treated as out-patients by utilising radon; such cases, usually with lesions of the forehead, face, &c., have to wear the apparatus continuously for 3–5 days and report each day for inspection. Later they report each day for dressing by vaseline gauze and inspection of the lesion until *all reaction has subsided and healing* complete.

The treatment of lesions of the inner surface of the cheek, lips, and floor of the mouth are based on the same principles and differ in no important respect from that above described, except that fixation of moulds in position is ensured by pressure of a cork plug in the case of the floor of the mouth and by moulding round the lip so as to take firm hold on the *chin in the case of the lower lip.*

TONGUE, FLOOR OF THE MOUTH, AND THEIR ADENOPATHIES.

For practical purposes it is useful to consider cancer of the tongue under two main headings, depending on its localisation in the anterior two-thirds or the posterior one-third. The treatment of these two groups differs considerably; when the lesion involves the floor of the mouth alone, the treatment again differs from that of either of the preceding lesions. When the lesion is less clearly defined, due allowance must be made and the treatment modified to suit the peculiar conditions present.

1. *Anterior Two-thirds of Tongue.*

Treatment is here directed to two distinct fields, the tongue and the neck.

(*a*) *Tongue Lesion.*—The treatment of the primary lesion of the anterior two-thirds is carried out by the well-known method of radium-puncture, the details of which differ but slightly from those of the technique commonly employed for similar lesions in this country. A uniform distribution of needles containing radon as previously described is possible with fair accuracy in lesions of limited extent. They are inserted without general anæsthesia after blocking the lingual nerve of one or both sides as required by novocain. They are sutured in position with silk and retained from five to seven days.

(*b*) *Treatment of the Glands.*—The results of operating on the glands of every case of carcinoma of the tongue treated for several years have shown that an important percentage of the glands clinically perceptible are not malignant. Further investigation shows that this non-invasion of the glands is more commonly associated with small unilateral lesions of the anterior two-thirds, and is less frequently associated with lesions of the posterior one-third and floor of the mouth. On the other hand, cases occur frequently in which no glands are clinically present but are discovered at operation and turn out to be malignant when examined microscopically. Therefore, irradiation of all cases would subject a considerable number of patients to unnecessary inconvenience and discomfort to no purpose, whilst non-treatment of cases in which no glands are perceptible would certainly be followed by the development in a certain number of glands which in due course would manifest malignant characters.

The present rule adopted where the primary growth is small, unilateral, strictly localised to the dorsum in its anterior two-thirds, and appears to have reacted well to local treatment by radium-puncture, is to treat the glands of that side by irradiation when they are clinically malignant. Where no glands are palpable, or, if palpable, they do not possess malignant characteristics, a block dissection is performed on the side of the lesion to ascertain the presence or not of malignant glands. If present, it may be presumed that the operation alone holds good prospect of cure under such ideal conditions before fixation is present and no further treatment is given. If malignancy is not present, the patient and surgeon are reassured as to the prognosis, and the patient has escaped the unpleasantness of a severe and useless irradiation.

In all cases other than those just quoted, irradiation of one or both sides of the neck is performed, and operation holds no place. That is to say, all necks are irradiated, usually bilaterally, in all cases of carcinoma of the anterior two-thirds (with the exception just mentioned), posterior third, and floor of the mouth.

The method of irradiation is on the same lines and involves the same principles as were indicated for the treatment of skin cancers by surface therapy. By increasing the distance so that the radiant surface is parallel to but situated at 6–8 cm. from the skin, and greatly increasing the charge of radium up to often ½ g. a miniature bomb is formed. The radiant surface is held at the required distance from the plaque of wax moulded to the skin by pillars of cork. The whole is surrounded by lead 4–5 mm. thick, the outer surface of which is again covered by wax to absorb secondary radiations. The radiant surface formed by fixing the requisite number of tubes of radium, screened by 1 mm. Pt., thus produces a well-distributed irradiation of the glandular field over which it is applied. The area treated is accurately measured and the dose given over eight to ten days which, experience teaches, will produce a selective chute of the epidermis, the apparatus being worn several hours a day, often ten, in a recumbent position with the neck well extended. The treatment of the other side follows that of the first, a useful cross-fire effect being thus produced.

The hours of treatment and discomfort of the patient might both be considerably reduced by the use of a suitable sized bomb of 2 g. or so in such cases, relieving the patient of the weight of the apparatus.

2. *Posterior Third of Tongue.*

In this lesion it is difficult and often impossible to produce a uniform irradiation by means of radium-puncture alone, owing to difficulty of access, and frequent extension to the vallecula, epiglottis, &c. It is not justifiable, therefore, to satisfy oneself with this treatment alone. It must be supplemented by an irradiation from the exterior.

The procedure adopted is to treat as efficiently as possible the lesion by radium-puncture on the usual lines, employing local anæsthesia. As soon as the treatment is finished, the supplementary treatment from the exterior is commenced by a bilateral application, first one side, then the other, as described for glands in the neck. This irradiation is designed to treat both the glands and the primary growth simultaneously, and for this purpose the radiant surface has to be arranged to reach a level which will permit irradiation across the base of the tongue. The total treatment takes three weeks. Hence operation to define the malignancy or not of glands is not justifiable, since the external irradiation is necessary for the cure of the primary and should not be postponed.

The time required for operation and healing would put off the supplementary irradiation ten days, during which time the primary is perhaps becoming resistant to further irradiation.

3. *Floor of the Mouth.*

In the treatment of this lesion radium-puncture is dangerous owing to the proximity of bone, and is likely to produce osteo-radionecrosis of the mandible whilst not curing the lesion.

Treatment is therefore planned so that a cross-fire effect is produced on the lesion by surface irradiation from within and without the mouth, using only the most penetrating rays, thus avoiding the possibility of bone complications as far as possible.

Treatment is commenced by moulding a suitable thickness (a few millimetres only) of Colombia paste to the lesion, charging it not too strongly, and aiming at the sterilisation only of the superficial part of the lesion. The apparatus is maintained in position several hours a day for five to seven days until a sufficient dose has been given. It is held in close apposition to the lesion by giving the patient a suitable rubber cork to insert between his upper teeth and the upper surface of the mould. By biting on this firmly during applications, not only is the mould immobilised but the upper jaw, lips, and tip of the tongue are held out of danger.

Internal application is immediately followed by external applications of large packs to both sides of the neck, which are modified to extend forward over the submental region, and are directed more upwards than in the case of the average apparatus for treatment of glands in the neck. This external application represents the most important part of the treatment of the floor of the mouth, owing to the large ports of entry permitted through the submaxillary and submental triangles of each side. Here, again, the importance of continuing the treatment of the primary growth uninterrupted must take precedence over any inclination to operate on the glands.

Where the lesion extends into the base of the tongue it is necessary to supplement the treatment by a radium-puncture confined to this region, which cannot be treated by the surface application successfully. Great care must be exercised not to carry the radium-puncture farther forward than is strictly necessary.

Where the lesion already involves the bone, necrosis must inevitably occur if cure is to ensue. The necrosis is, however, more limited by employing the technique described than is possible when methods such as radium-puncture and seeds are employed, with their inevitable caustic radiation.

CERVIX UTERI.

The method employed is intracavitation radium therapy, by the application of a uterine sound of rubber containing a variable number of radium tubes according to the length of the canal previously determined, and a vaginal applicator, the colpostat, which consists essentially of two cylindrical hollow corks, held apart by watchspring, each containing a radium tube.

The uterine sound is rendered semi-rigid by introducing into it a cylinder of thin aluminium 1/20 mm. thick. The tubes inserted in an ordinary case are two of 13·3 mg. and one of 6·6 mg. Ra. el., all having a wall of 1 mm. Pt. In each cork of the colpostat is placed a tube of 13·3 mg. The spring and corks are wound round with rubber and collodionised. A central cork containing 6·6 mg. Ra. is usually inserted between the cervix and the spring of the colpostat, each cork of which rests in a lateral fornix. All tubes used in the vagina have a primary filtration of 1·5 mm. Pt.

This application is performed without anæsthesia, with but little discomfort except a little during dilatation. A light packing to maintain the central cork in position is all that is necessary. The whole outfit is removed daily, sterilised whilst the patient receives a vaginal douche, and reinserted. The apparatus is retained for five days, except for such daily removals.

Such a treatment giving a total dose of 60 Mcd. or approximately 8000 mg. hrs. may be said to be typical. Actually, whilst the dose varies but little, the number and strength of foci used are greatly varied to suit the individual, by the addition of further uterine tubes and the insertion often of two or three central corks, always accompanied by a corresponding decrease in the strength of tubes, a 13·3 mg. tube being replaced by two 6·6 mg., so that uniformity of irradiation may be as complete as possible.

This treatment unsupplemented is considered effective only for Grade 1 cases, where disease is confined to the cervix. In all other cases supplementary treatment by deep X rays or radium at a distance is held to be essential, and is always given, either before or, more usually, after the local treatment. In this region, deep X rays seem to give results as good as those by bomb therapy as a supplementary treatment.

Various techniques employed in England to-day, whose local treatment probably falls far short of the efficacy of the above-described treatment by colpostat and sound, do not include any supplementary treatment to the parametria and pelvic glands. Little wonder that certain gynæcologists still regard operation as preferable to irradiation. A well-planned operation seems preferable to a half-hearted irradiation, but it is to be hoped that the latter method will disappear, and give place to a whole-hearted, well-planned treatment by radium and deep therapy combined, which may be capable of improving on the results of the best operative technique.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Physical Welfare at Edinburgh University.

THE Edinburgh University Court has appointed Colonel R. B. Campbell as director under the scheme for the promotion of the physical welfare of students and the development of University athletics. Some years ago Dr. Tait Mackenzie, of Pennsylvania University, lectured in Edinburgh on the need for placing the physical welfare of students on a sound medical footing. In his own university he has charge of the health of all the students, grading their exercise (or no exercise) to suit the physical condition on entry and throughout the curriculum, and selecting from time to time those who show special aptitudes for the heavier games. In a University of some 10,000 students this is an onerous task, but Dr. Mackenzie seemed satisfied that the general results were good. His sculptures show what ideals he aims at.

In Edinburgh, where the number of students approaches 4000 (men and women), the University has not seen fit to appoint a qualified medical practitioner, but a distinguished army officer. His record commands respect; but the physical welfare of the students, it is hardly necessary to say, is not even primarily a question of athletics; it is first a question of health and adaptation of selected exercise. For many years the students at the Provincial Training Colleges have been under medical supervision and each has access to the doctor. About twenty years ago the Scottish Education Department succeeded in displacing the drill sergeant from the elementary, higher grade and secondary schools, and in securing the appointment of a superintendent of physical education trained by the College of Hygiene in Dunfermline or places of similar standing. The system of physical education in all classes of schools is now well organised and under the direction of the medical officer of the department, who also inspects the hygienic training of teachers at the colleges. The idea now being pushed forward is that physical education shall come more and more under the direction of the school medical officer.

The problem at the Universities is different and perhaps the University Court may mean to place an adequate medical staff at the disposal of the director. The matriculation fee has been increased by 10*s.* a year to form a physical welfare fund. Lord Constable's Committee also recommended that an officer of the University should be appointed to direct in a general way the athletic activities and the physical culture of students. The work of the director is not, therefore, confined to athletics. He has himself been inspector of physical training in the army and experience will have taught him where the weak points in candidates for physical culture lie. But, in the end, if the system is to succeed in fitting the student to his work, the physician and the surgeon will both have to come in at some stage. It cannot be assumed that the big proportion of students unfit for violent games are to pay an extra fee merely that the more fit may be better equipped and trained. It is not necessary now to say anything about the correlation of cerebral with muscular training. But the problem is far from simple.

Night Baking.

The proposal to abolish night baking has caused considerable disturbance in the Glasgow trade. It is alleged that only a small proportion of the employees will benefit from the abolition and a large proportion will be seriously disadvantaged. The price of bread, and particularly of rolls, it is said, will certainly rise. During the war, when an officer of the Scottish Board of Health in order to economise consumption suggested that no bread should be sold that was less than 30 or 48 hours old (I forget the exact figure), the great objection was that this would involve expansion of premises in order to accommodate the accumulated loaves. By the present system they are cleared out at the earliest possible moment. Probably the same difficulty would arise from the abolition of night baking; for some of the Glasgow employers seem to make a point of providing fresh bread and maintain that bread half a day old, or even a day old, would be stale. This, of course, is nonsensical. The objection to "stale" bread is a matter of taste, many consumers preferring it to fresh bread. There is, however, no doubt that the abolition of night baking will involve a very serious rearrangement of hours and duties. It is to be noted that the abolition of underground bakehouses took about a generation to accomplish. There is a doubt whether it is fully accomplished yet; to the small shop-keeping baker the convenience of the underground bakehouses is so great as to over-ride every other consideration. The employees of the Edinburgh trade meet all these points in detail, and point out that the abolition of night baking was recommended after a full inquiry into all the conditions.

Edinburgh Death-rate.

The Edinburgh death-rate for 1929 was 15·1 per 1000 as against 13·7 per 1000 in 1928. The increase is said to be due to the influenza epidemic and to 638 deaths from pneumonia. The infantile mortality was 80 per 1000 births as against 75 per 1000 in 1928. The population shows a tendency to decrease. There is considerable shifting of population within the City itself. One striking fact is that not a single death from measles has been recorded in the City since July, 1928. This is probably a record. In the years 1893–95 measles swept away hundreds.

Dr. William Macrae Taylor.

By the death of Dr. Macrae Taylor Edinburgh has lost one of her most attractive personalities. Dr. Taylor was not merely a widely educated physician and surgeon, but also a man with a gift for social affairs. He was ready to do work that medical men do not as a rule find interesting. For example, he acted for a period as treasurer to the Medico-Chirurgical Society and the Obstetrical Society, as well as to the Tuberculosis Society. This meant a great deal of correspondence and troublesome detail. But Taylor used the occasion to bring harmony and coördination into the working of the various societies, and he did so with the ease that comes of a large and pleasing temperament. For more than 25 years he was medical officer of Cargilfield School for boys, which is one of the best-known schools of the English public school type in Scotland. As far back as the Boer War he held a commission in the R.A.M.C. and in the Great War he did more than his share. He was a Territorial officer and at once volunteered for service abroad, going to France in 1915. In 1916 he became D.A.D.M.S. with the 69th Division. He also saw service in Italy, and in 1919 retired with the rank of Surgeon-Major. He seemed by nature adapted to offices involving responsibility and work was no trouble to him. In many ways the profession in Edinburgh has shown how much he was respected as a medical man and how much he is missed. He was a favourite all round and belonged, perhaps, less to the highly technical and specialised medicine of to-day than to the medicine of one or two generations ago when the larger men were not too much occupied to take an active part in the social life of a cultured city.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Hospitals and Lotteries.

A BILL obtained its first reading in the Dail before Christmas, the object of which is to grant powers to enable funds to be raised by means of sweepstakes and drawing of prizes for the support of public charitable hospitals and sanatoriums in the Irish Free State. A deputation of medical men connected with some of the Dublin hospitals waited on President Cosgrave last week to ask him to facilitate, as far as possible, the further passage of the Bill. Hitherto the Government has maintained a strict attitude in regard to sweepstakes and lotteries of all kinds, and has refused to make exceptions for hospitals or other charitable institutions. The deputation pointed out to the President that some of the Dublin hospitals are in a bad way financially, owing to the falling off of subscriptions and the increase of expenditure. The work of the hospitals is being hampered by shortness of funds. The President promised to give the representations made to him his best attention. Coincidently with the visit of the deputation alarmist rumours as to the position of some of the hospitals have appeared in the daily press. It is stated, for example, that unless some means of raising money is discovered a number of the Dublin hospitals must be closed. No hint is given as to the particular hospitals which are in this plight, and it is, therefore, impossible to investigate the accuracy of the statement. As far as can be discovered, however, no hospital has had as yet to consider the problem of closing its doors. While it is generally recognised that the problem of finance is a serious one to the Dublin hospitals, there is a good deal of difference of opinion, both in the medical profession and among lay governors of hospitals, as to whether sweepstakes and lotteries are the best way of raising money. There is the general objection to public lotteries which has induced most civilised Governments to declare them illegal. Apart from this, it is thought by many that the temporary relief which may be given by a successful lottery will be followed by a greater reaction, which will diminish further than ever the ordinary income of the hospitals from subscriptions. Much of the falling away in the income from subscriptions appears to be due to the generally accepted opinion that the hospitals receive an adequate income from the payments made by patients. If the public get the further notion that the hospitals have a gold-mine within their reach in the form of a lottery or sweepstake, subscriptions are likely to fall further.

Death of Mr. Kennedy Cahill.

The sudden death of Mr. F. Kennedy Cahill on Jan. 27th has come as a shock to many friends. He had been in his usual health when retiring the evening before. Mr. Cahill qualified in 1901, and was admitted to the Fellowship of the Royal College of Surgeons in Ireland in 1907. Having spent a few years in his younger days as poor-law medical officer at Dundrum, Co. Dublin, Cahill moved into Dublin and devoted himself to practice in the specialty of diseases of the stomach. He was much interested in art and literature, and had many friends among the artistic and literary people in Dublin. He was a kindly and simple character, liked by everyone, and never happier than when doing a kindness.

A HOSPITAL FIRE.—At 5 A.M. on Jan. 25th a night nurse at Bristol General Hospital gave an alarm of fire, and it was found that a room on the first floor used for developing X ray photographs was ablaze. Dr. S. H. Griffiths, the senior resident surgeon, and the night staff succeeded in keeping the fire within bounds until the arrival of the fire brigade, when it was speedily extinguished. There were 250 patients in the hospital and three wards were for a time in danger.

SYON PARK AND WEST MIDDLESEX HOSPITAL.—At the meeting of the Middlesex County Council at the end of last week there was some discussion upon the proposal of the Rivers Committee of the Council that a portion of the park of Syon House, Isleworth, should be taken for sewage disposal purposes. Captain Burgess pointed out the undesirability of establishing sewage works close to the West Middlesex Poor Law Hospital, Isleworth, which at present has 400 beds and will shortly have 700. It has been decided not to proceed with the proposal.

BIRMINGHAM HOSPITALS CENTRE.

AWARD IN DESIGN COMPETITION.

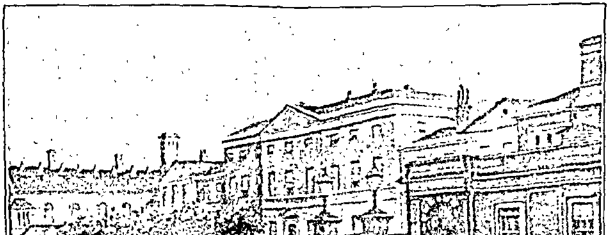
FOR many years past the Executive Board of the Birmingham Hospitals Centre has been giving earnest consideration to the subject of securing a closer coördination of hospital and medical facilities in Birmingham, and in the more recent years has devoted its activities to the preparation of a practical scheme for this purpose. The completion of a schedule of all known requirements was effected in 1929, when 12 architects were selected to take part in a limited competition for designs for a general hospital of 740 beds, a paying patients' block of 100 beds, and buildings for the medical faculty of the University. The faculty is at present housed in the city, some two miles from the present University site. The assessor's award has now been made, and the possibility, long in the minds of some of Birmingham's foremost citizens and doctors, of making the city the hospital capital of Great Britain, has been advanced an important step forward.

How the Scheme Arose.

The origin of the hospitals centre scheme goes back to 1920, when the city was able to resume normal conditions after the war. The ruling factor in the situation was that both the two leading voluntary hospitals, the General and the Queen's, had an increasing deficiency of beds relative to the demands made upon them and the growth of population. How was this deficiency to be met? Was the right solution simply to extend each hospital so as to provide the increasing accommodation required by civic needs and also meet the demands made by the growth of science in the many auxiliary services required? Each of these hospitals was in a densely populated quarter, and, apart from other considerations, expansion promised to be neither easy nor economical.

The medical school of the University was also concerned. Each of these hospitals was a teaching hospital for that school, and the medical staffs were closely linked up with the members of the medical faculty. The two voluntary hospitals, in fact, were not only hospitals for civic needs, but also an integral part of a coördinated scheme of the medical school; they were the chief centres where medical students would be trained and facilities provided for the advance of medical knowledge, for research, and for linking up the clinician with the scientific personnel of the University departments in such subjects as anatomy, physiology, pathology, bacteriology, and biochemistry.

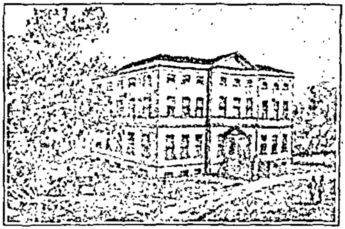
FIG. 2.



The same in 1895 just prior to the move.

Growing Hospital Developments.

FIG. 1.

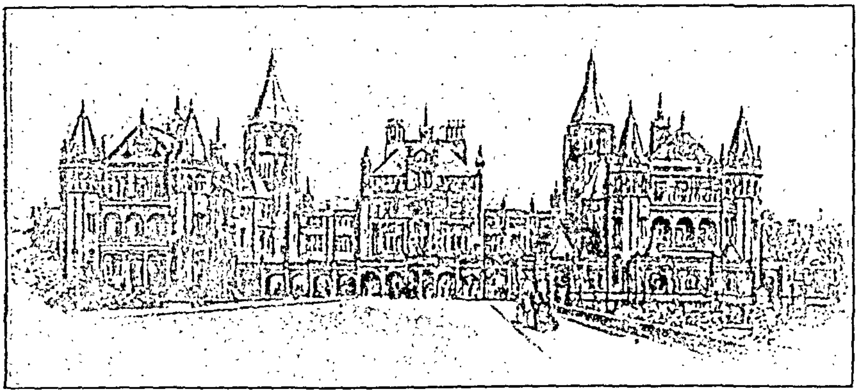


The old Birmingham General Hospital in Summer-lane, opened in 1779.

The Board kept constantly in mind the triple function of a voluntary hospital which is also a teaching hospital—namely, (1) to provide the best medical treatment available for its patients; (2) to be a school for the training of future members of the medical profession and also, not less important, the nursing profession: and (3) to be a centre for the advancement of medical knowledge and science, which cannot be separated into a compartment by itself but must be linked with other scientific departments in the University, such as biology, chemistry, and physics. Each of the two hospitals concerned evolved a separate and independent extension scheme, and this brought the whole situation to a head. By that date—i.e., about 1923–24—many of those most deeply interested were aware that in other great industrial and civic centres, both in Great Britain and on the Continent, the right solution of the hospital problem was being found in going outside the main centre of population and building up on unoccupied ground a hospital centre, with free ground for expansion as the future required, and for linking up with all sorts of subsidiary and specialised institutions. The same argument had prevailed in 1900, when it was decided by the founders of the University to establish a University quarter at Edgbaston.

Science and medical science continuously develop. It is impossible to predict what form they may take or what requirements are essential to meet their needs, and those who advocated a hospitals centre for Birmingham felt that no extension, however considerable, of the General and the Queen's would really meet the demands of the future; it would be at best only a temporary solution for this generation. But where was the site for this centre to be found? This was both a question of money, of hospital, and of medical school requirements. The argument already outlined indicates that the new hospital ought to be somewhere in immediate relation to the University, and particularly its scientific departments. The latter had already migrated to Edgbaston, but so long as its two central teaching hospitals remained on their present sites it was impossible to transfer the medical faculty from Edmund-street to the Edgbaston site.

FIG. 3.

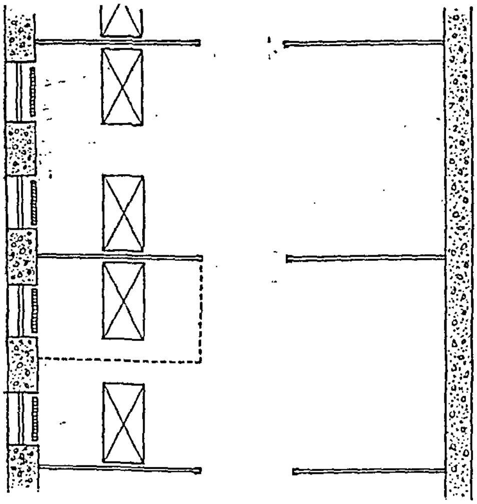


The new General Hospital in Steelhouse-lane opened in 1897.

Amalgamation on a New Site.

Agreement was reached at last when Messrs. Cadbury Bros. offered to the city 150 acres of land at Edgbaston lying to the north-west of and immediately adjoining the University buildings. It was only necessary to allocate (say) 25 acres of this new site to provide everything that a hospitals centre for the next 20 years would require, and which could then be linked up definitely with the University on the other side of the canal. The next step was to bring the General and Queen's Hospitals into agreement, and a joint committee was formed of representatives of both hospitals, under the chairmanship of Sir Charles Grant Robertson, to investigate the problem and recommend a solution. The committee's report contained the two main points: (1) that the new hospitals centre should be established at Edgbaston and should be under the joint control of the General and Queen's Hospitals—that is to say, it was to be a joint extension of both hospitals, taking the place of the separate extensions which had been contemplated and prepared; (2) that in order to achieve this satisfactorily, the General and Queen's Hospitals "should be amalgamated for all purposes."

FIG. 4.

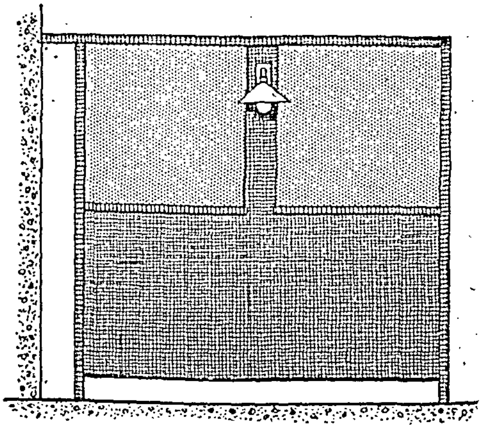


Plan of a ward unit with the new lengthways arrangement of beds.

Both hospitals having accepted these and the other recommendations in the report, an Executive Board was set up for the new hospitals centre with Sir Charles Robertson as chairman. Its first function was to make a detailed and technical scheme. Commissions were sent to the Continent and to the United States to study recent developments in hospital design and organisation, and a scheme was framed on the basis of the reports of these commissions. Finally an architects' competition was arranged with Mr. Percy H. Adams, F.R.I.B.A., as assessor.

Concurrently with the investigations of the Executive Board, the whole question of the organisation of the medical school has been under the careful consideration of the Medical Faculty of the University, and which has been kept in close touch with the Board's deliberations. It was the function in particular of the Faculty to decide on the character and requirements of the medical school as a school of the University, and their recommendations were finally accepted by both the University and the Board.

FIG. 5.



Elevation of the screen which separates the heads of adjacent beds in the new ward arrangement.

A Scheme with Three Aims.

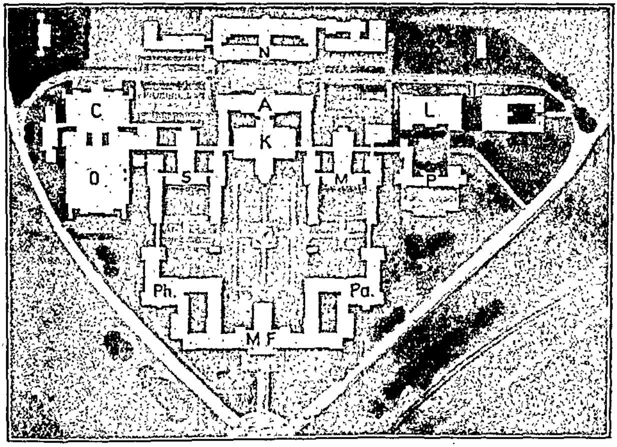
Three main characteristics of the scheme make it unique for Great Britain.

1. The hospital proper will represent the latest ideas and experience in the design, planning, and administration of a hospital considered simply as an institution for the treatment and cure of disease. Neither trouble nor investigation has been spared in order to see that this aspect has been fully met. When the scheme is completed Birmingham will have a hospital at least the equal of any in the world.

2. In accordance with the trend of modern ideas and needs, the scheme includes a big block, also designed on the most modern lines and in close relation to the hospital proper, for paying patients. The Birmingham citizen who does not come within the ordinary category of hospital patient will thus enjoy at the lowest available cost the advantages of institutional treatment and will have at disposal all the skill and experience of the medical, nursing, and administrative staff. The new hospital centre is to serve the needs of *all* classes of citizens.

3. There will be close and integral connexion between the scientific departments and buildings of the medical school and those of the hospital proper. Both the Board and the Faculty were agreed that the link between the scientist and the clinician was essential for the treatment and cure of disease, no less than for the training of students and for the advancement of medical knowledge. In the proposed linkage between science and treatment, between the clinician and the scientist, between laboratory and ward, the centre will be working on the lines accepted in the newest and most progressive hospitals and medical schools on the Continent and in America.

FIG. 7.

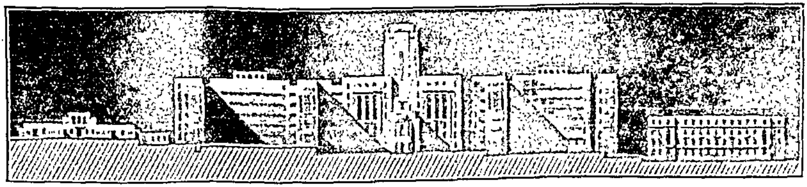


Site plan of the same showing completion of the quadrangle by the medical faculty building on the south.

C = Casualty. O = Out-patients. S = Surgical block. M = Medical block. K = Kitchen. A = Administration. N = Nurses' home. P = Paying patients. L = Laundry. M.F. = Medical faculty. Ph. = Physiology department. Pa. = Pathology department.

It is estimated that the scheme when completed will have cost something approaching £1,250,000. In carrying it through Birmingham aims at influencing scientific thought and civic progress elsewhere. Laymen and leaders of the medical profession in Birmingham have worked whole-heartedly together in the preparation of this scheme, but the decision finally rests with the citizens of Birmingham, to whom an appeal will be made in March.

FIG. 6.



Winning design for the Hospitals Centre in Edgbaston. South elevation of the hospital block.

Plan of the Wards.

In planning the wards it was suggested to the competing architects that the unit system should be adopted. Each member of the senior staff was to be provided with a unit of 60 beds and accessory services, such as clinical laboratories, record-room, operating-theatre (on the surgical side), for which he is responsible; all of them where possible on the same floor and under the control of one sister. The 60 beds were to be divided equally between the sexes, with, in either case, one ward of 16, two wards of 4, and three wards of 2 beds each. The architects were asked to think of the beds lying as far as possible parallel to the windows, instead of at right angles to them, which will result in an arrangement of the 16-bed ward familiar enough in America although not yet seen anywhere in this country; it is, however, we believe, on the specification for the new Southend hospital. The beds, as will be seen on the rough plan (Fig. 4), will back on to partition screens projecting 8 feet into the ward; each bed will thus have its own window and radiator on one or other side, no patient being compelled to look straight into the light. The arrangement makes it easy (as shown by the dotted line) to place a temporary screen round a particular bed which will still retain its own light and ventilation. The screen (Fig. 5) itself is of sheet-metal below with glass panels above, divided by a mullion carrying electric lamp, bell, wireless, and so forth; for cleanliness and ventilation the screen does not reach either the wall at the side or the floor below. The screens are placed 10 feet apart, and there is a clear space of 6 feet down the centre of the ward. This longitudinal arrangement of beds reduces by a couple of feet or so the width of the ward (which need only be 22 feet) and therewith the cost of construction by quite a large amount.

The Winning Design.

Prizes of £500, £300, £200, and £100 were offered for the four best plans sent in, and the winning design was submitted by Messrs. Lanchester & Lodge (19, Bedford-square, London, W.C. 1.), the others in order of merit by Mr. S. N. Cooke (Sun Building, Bennett's-hill, Birmingham), Mr. Charles E. Elcock (of Elcock and Sutcliffe, 21, Northumberland-avenue, London, W.C. 2), and Messrs. Pite, Son, and Fairweather (12, Carteret-street, London, S.W. 1.) bracketed with Messrs. W. and T. R. Milburn (10, Fawcett-street, Sunderland). Mr. Lanchester is the designer, among other things, of the Central Hall, Westminster, the University of Leeds, and the Cardiff Municipal Buildings, and is now carrying out the reconstruction scheme of St. Bartholomew's Hospital; his colleague, Mr. Lodge, has specialised in hospital work. Their design is a remarkable architectural effort; some idea of its impressive character may be gained from the elevation of the south aspect reproduced here (Fig. 6). The administration block is centrally placed with the chapel in the middle and the blocks of wards lying right and left of this central building; at the extreme end of the elevation to the left is the out-patient department and to the right the block for paying patients. The main access runs from north to south, with the nurses' home on the highest ground, then the hospital and, finally, nearest to the entrance from the University and stretching across the site with a main façade of over 600 feet, the medical faculty building with the library overlooking the road leading to the University. A glance at the site plan (Fig. 7) will show how every section of the hospital community seems to have been considered in regard to light and air, although one cannot avoid the impression that the nurses' home, situated so closely north of the administration block, will have much of its possible sunshine cut off in the winter months. The medical faculty is housed in a low building on the south side of the main frontage only two floors high, which will be a boon to the students attending lectures, who will be freed from the tiresome necessity of ascending and descending innumerable stairs. Inasmuch as all the buildings are planned inside a ring road it is feasible to connect them by covered ways and corridors. Communications are all well thought out, especially the service from the central kitchen, which, curiously enough, seems to err if anything on the side of being rather large.

MEDICINE AND THE LAW.

Workmen's Compensation: Effect of Wife's Ill-health.

A RAILWAYMAN, living in a country village in Lincolnshire, refused to go to any of the places where work was offered him. He had lost an eye in an accident in October, 1928, and was paid compensation at the rate of 30*s.* a week till February, 1929, when the weekly sum was reduced to 7*s.* 7*d.* His pre-accident earnings were over £3; the London and North-Eastern Railway, his employers, offered him work at £2 6*s.* 9*d.*, but he refused the offers because of his wife's ill-health, and because he could not get accommodation suitable for her and the family. The county court judge found that the work offered was suitable. The question was whether a workman was entitled, for the purposes of the Workmen's Compensation Act, to refuse to take suitable work in a different town on the grounds of the health and housing of his family. The county court judge declared himself unable to take into account the lack of accommodation, the wife's health, or the state of the labour market. The Court of Appeal has upheld this decision. The Workmen's Compensation Act, says Lord Justice Scrutton, excludes the consideration of the workman's ties to his family. "Supposing he had ten children and two of them were liable to consumption, he could not refuse suitable employment on the ground that his two children could not live in the place where the work was offered."

The point does not seem to have been decided before. This refusal of work in connexion with workmen's compensation (by a workman whose capacity has been reduced by accident but who is nevertheless able to earn in some suitable employment wages which will save his employer from paying him compensation as for total incapacity) must, of course, be distinguished from the topic, recently much discussed by Parliament, as to the steps which a man must take towards the positive pursuit of work in order to justify the receipt of unemployment insurance benefit.

CARBON MONOXIDE POISONING.

AN AMERICAN REPORT.

THE American Medical Association recently appointed a committee to consider the risks of carbon monoxide poisoning and the best way of preventing fatalities. This Committee has just published its first report,[1] drafted by Prof. Yandell Henderson.

In the course of this review it is stated that most of the cooking stoves and heaters in which gas is burned have the defect that the flame of the burning gas is chilled when it comes near a cooking utensil and the chilling stops combustion at the first stage, liberating carbon monoxide. Cooks who work with such stoves very often have the headaches which are typical of a low grade of intoxication by this gas. The defect can be remedied to a certain extent by increasing the distance between the orifice of the gas burner and the cooking utensil, which should be held just above and not in the visible flame. When patients are found dead in closed rooms where there is a stove or water-heater the accident is often attributed, not to carbon monoxide, but to "exhaustion of oxygen in the air by the fire." This explanation, however, is incorrect, for if the oxygen were reduced to 16 per cent. the fire would go out, but life would not be threatened until the quantity was down to about 8 per cent. All such fatalities are in reality due to carbon monoxide. Another risk to life arises from the fumes of burning buildings, where carbon monoxide is produced in great amounts and often overcomes the firemen. Similarly, in coal and other mines it is the carbon monoxide far more than the explosion that causes the death of the miner. Carbon monoxide produced from water-gas is being used more and more in industry as the starting-point for the manufacture of such substances as methanol.

Poisoning from Illuminating Gas.

The Committee points out that while gas is a common means of suicidal death it also causes a number of accidental deaths. The gas used in American cities to-day is formed either by the destructive distillation of coal, which produces a gas containing about 7 per cent. of carbon monoxide, or else by blowing steam through red-hot coal to produce water-gas, which contains 40 per cent. of carbon monoxide. The average city gas in the United States is a mixture of these products and contains about 20 per cent. of carbon monoxide. More than 500 deaths in a year are caused in New York City by an illuminating gas which contains a high percentage of the monoxide. One of the chief difficulties in the way of lowering this mortality is economy. Gas which contains a low percentage of carbon monoxide costs much more than a gas which contains a high percentage. For this reason the Committee thinks it important to educate public opinion to realise that the cheap thing is not the safest and that the best way of paying for gas is on the basis of the heat unit and not of the cubic foot. Scientific advances during the next few years may lead to the manufacture from cheap coal of a gas which is low in carbon monoxide, high in calorific value, and moderate in price. Such a gas need not involve many fatalities even when used in enormous quantities, and experimental investigations of the possibilities of producing it deserve liberal financial support. Meanwhile much could be done by the elimination of sheer carelessness. Individuals and public authorities in the United States go on countenancing the use of defective pipes and connexions and flueless water-heaters and geysers. Inadequate and cheap apparatus continues to be sold. The Committee recommends that gas should only be burned in appliances with fixed connexions, as even the best quality of flexible piping may become disconnected. It also suggests that the municipality should be responsible for seeing that flues are provided for water heaters and stoves, and furnaces and connexions periodically inspected.

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[1] Jour. Amer. Med. Assoc., Jan. 18th, p. 179.

Motor-car Dangers.

The combustion of air and petrol under pressure in the modern car is never complete and the exhaust gas always contains some carbon monoxide, which may reach as much as 7 per cent. when the carburettor is set to supply a rich mixture for quick starting-up in traffic. Roughly, for each 20 h.p. of the motor, one cubic foot of carbon monoxide is produced each minute. The Committee suggest that the newspapers should publish each year before the cold weather begins warnings against starting an engine in a closed garage. The memory of the public is short and, although many deaths have been reported, people still suppose that the danger will not afflict them personally or that at least they will feel some ill-effect before they are overcome. But carbon monoxide gives no warning; its first effect is a sudden muscular weakness which renders the victim helpless. There should be a rule in large garages that no engine may be run for more than a very short time, for if this precaution is disregarded no amount of artificial ventilation will keep the air pure. In repair shops a flexible hose can be connected to the exhaust pipe of the car under repair so that the gas can be conducted out of doors.

Analyses of street air have shown that there is not really enough carbon monoxide in it to be poisonous, but there is certainly enough to join with the fumes of oil, dust, and smoke in contributing to the chronic fatigue of those who breathe this polluted air. It has been suggested that the vertical exhaust, if brought into general use on commercial vehicles and cabs, would considerably decrease the contamination of the air in congested traffic.

Treatment of Carbon Monoxide Poisoning.

The Committee is strongly in favour of inhalational treatment, because the asphyxia of carbon monoxide may continue in full force some time after the patient has been removed from the polluted atmosphere. If he is sent to hospital in an ambulance, he may well die on the way. Every minute of delay increases the chance of fatal injury to the brain, or at least of a subsequent pneumonia or damage to the heart. The carbon monoxide must be eliminated from the blood at the earliest possible moment. The victim should not be moved at all, or only for a few feet. Artificial respiration by the prone pressure method should be started without a moment's delay and continued until breathing returns or there is no doubt of the fact of death. So long as the victim is breathing, artificial respiration is undesirable, but inhalation of oxygen and carbon dioxide should be given at once or, if the mixture is not available, oxygen alone. While one helper sees to the artificial respiration, another should give the inhalation. Meanwhile the patient must be kept warm, and coats and blankets must be put under him as well as over him if he is lying on a cold surface. He should not be allowed to make any exertion until he is completely restored, as the heart may be badly strained thereby. The less the hypodermic syringe is used the better, and the practitioner is advised to leave the work of resuscitation to the specially trained rescue crews of the gas company and fire department if they are available. Transfusion of blood is quite useless though not actually harmful.

The inhalator generally used contains one or two cylinders of oxygen with which 7 per cent. of carbon dioxide has been mixed, and the Committee recommends that every ambulance should carry an apparatus of this kind. There are many advantages in using carbon dioxide as well as oxygen. An asphyxiated patient may not breathe enough oxygen to turn the carbon monoxide out of his blood. Oxygen is not a respiratory stimulant and may even be a depressant, and it is of little use alone where substances such as those of the benzene series have been inhaled as well as monoxide. Carbon dioxide restores full deep breathing, even in profound asphyxia, and displaces other poisonous gases besides carbon monoxide from the blood by inducing rapid ventilation. Moreover, full dilatation of the lungs after asphyxia tends to prevent subsequent pneumonia, which is otherwise common and has a high mortality. Carbon dioxide also rapidly restores the acid-base balance of the blood and tissues. The Committee states emphatically that pulmotors, lung motors, and other mechanical devices for artificial respiration should be replaced by general training in the prone-pressure method (Schafer).

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDING JAN. 25th, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 313 (last week 414); scarlet fever, 3225; diphtheria, 2033; enteric fever, 41; pneumonia, 1230; puerperal fever, 46; puerperal pyrexia, 139; cerebro-spinal fever, 11; acute poliomyelitis, 5; acute polio-encephalitis, 1; encephalitis lethargica, 14; continued fever, 1; dysentery, 9; ophthalmia neonatorum, 92. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Jan. 28th-29th was as follows:—Small-pox, 523 under treatment, 29 under observation (last week 528 and 18 respectively); scarlet fever, 2410; diphtheria, 2720; enteric fever, 19; measles, 954; whooping-cough, 119; puerperal fever, 34 (plus 18 babies); encephalitis lethargica, 121; poliomyelitis, 1; "other diseases," 17. At St. Margaret's Hospital there were 20 babies with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was 1 death from small-pox, 3 (1) from enteric fever, 46 (22) from measles, 14 (2) from scarlet fever, 29 (3) from whooping-cough, 66 (12) from diphtheria, 39 (6) from diarrhœa and enteritis under two years, and 74 (16) from influenza. The figures in parentheses are those for London itself.

Small-pox was mentioned as a cause of death in a case assigned to Leicester (County Borough). The 2 fatal cases of enteric fever outside London were at Salford and Leeds. Measles accounted for 7 deaths in Manchester (where there were 738 fresh cases) and 3 in West Ham; whooping-cough for 6 in Birmingham and 3 each in Liverpool and Bradford. There were 12 deaths from diphtheria in Liverpool, 4 in Cardiff, and 3 each in Bristol, Birmingham, and Coventry. No great town had to report more than 4 deaths from influenza.

The number of stillbirths notified during the week was 295 (corresponding to a rate of 46 per 1000 births), including 53 in London.

DONATIONS AND BEQUESTS.—Mr. Frederick William Smith, of Woodville, Longridge, Lancs, left £1000 to Dr. F. W. Price, of Harley-street, London, to be applied as he shall think fit, for the benefit of the Heart Hospital, London.—Among other bequests, Mr. John Edward Faire, J.P., of Evington Hall, Leicester, left £5000 to the John Faire Hospital and £2000 to the Leicester and Leicestershire Maternity Hospital for general purposes.

Correspondence.

"Audi alteram partem."

MENTALITY AND ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—In a leading article in your issue of Jan. 25th (p. 193) you were good enough to refer to a paper written by me in the *British Journal of Anæsthesia*. In your kindly notice, however, you have missed, no doubt inadvertently, the main drift of my remarks. In an address I gave before the Royal Society of Medicine in 1920, entitled The Psychology of Anæsthesia, I drew attention to the neglected study of the subconscious side of patients requiring medical or surgical aid. I dwelt especially upon the effect of psychic influence in anæsthesia. The preponderating effects of buried brain-memories and the more recent profound impressions, such as the Great War brought into existence, were considered. The recent article, Mentality in Anæsthesia, was written as an extension and amplification of The Psychology of Anæsthesia. In it I advanced the contention that while most anæsthetists are careful to study and, indeed, to master the intricacies of the physical characteristics of their patients which might bring about unusual reactions of drugs used in anæsthesia, some do not, as a rule, study the psychical side of the problem and such study I submitted was at least as important.

Your reference to my article, however, appears to me to convey the inference that I devoted my remarks chiefly to the physical rather than to the psychical aspect of the problem. I trust that you will permit me, since I contend that the matter is really one of great importance, to correct this error and to point out that the subject of my paper is the psychical and not the physical side of anæsthesia. I am glad to learn that you attach importance to this subject and that the statements which appeared in my former paper find an echo in the concluding paragraphs of your article.

I am, Sir, yours faithfully,

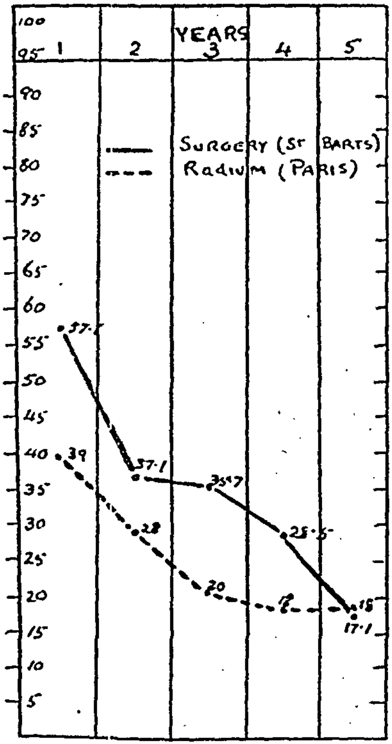
Boxmoor, Jan. 31st, 1930. DUDLEY W. BUXTON.

RADIUM OR EXCISION FOR EPITHELIOMA OF THE TONGUE

To the Editor of THE LANCET.

SIR,—Prof. Gask's admirable study of the treatment of epithelioma of the tongue by radium is of the greatest service at the present time when so many surgeons are trying out the new method. In striving to be fair to radium he is, however, a little less than fair to excision. Many of the figures he quoted are from old statistics. Since they were published the results which have been obtained, owing to improvements in anæsthesia, more extensive dissection of the glands, and the use of diathermic excision for the primary growth, are considerably better. Rendle Short reports 40 per cent. of three-year cures following the complete operation upon the tongue and glands at the Bristol Royal Infirmary.

Last year, for the purpose of the second edition of Recent Advances in Surgery, I had occasion to visit radium centres on the Continent, and to go into the available figures concerning the treatment by excision and by radium of cancers in various situations. The results in cancer of the tongue of operation by modern methods are probably much more fairly represented by the figure of 35·7 per cent. for three years obtained at St. Bartholomew's than by the 20 to 25 per cent. estimated by Prof. Gask. It is therefore hardly just, when referring to the 21·6 per cent. of three-year cures obtained in Paris by radium, to say that "this does not appear to be much better than the results of surgery." The Radiumhemmet figures he quotes give 14 cases alive out of 46 treated, a survival-rate of 30·4 per cent., but many of these had only recently been treated. The latest Stockholm figures in 1929 showed only 13 cases alive out of 71 treated over a period of six years, or an average of 18 per cent., and 5 of these 13 had been treated less than a year. Prof. Gask further remarks that if the period of observation is extended the percentage of cures by surgery would be further reduced. This is also true of cases treated by radium. The St. Bartholomew's surgical cases show 10 per cent. of seven-year cures, the Paris radium cases 11 per cent. The statement that if the primary growth be treated early (by radium) it can be made to disappear in the great majority of cases also needs qualification; in the cases treated by Regaud with radium the primary growth was not arrested in 56 per cent. In the accompanying graph I have added the curve of the Paris radium statistics, taken from Prof. Regaud's article in the American Journal of Roentgenology and Radium Therapy of January 1929, to that of Prof. Gask.



Epithelioma of tongue. Five-year survival rate of cases treated by surgery and by radium.

I do not wish in any way to belittle Prof. Gask's main thesis, which is admirable, or to decry the use of radium in cancer of the tongue, for I use it myself whenever possible. But if we are to advance we must face the truth, which is that at the present time, with the single exception of cancer of the lip, the results obtained by the best workers with radium are inferior to those obtained with excision by surgeons of equal standing. By careful research work, such as that carried on by the unit which Prof. Gask represents, the position may be reversed in the future. But that time has not yet come.

I am, Sir, yours faithfully,

W. H. OGILVIE.

Harley-street, W., Feb. 3rd, 1930.

PSITTACOSIS.

To the Editor of THE LANCET.

SIR,—Notices have already appeared in the press to the effect that a member of the female nursing staff of the Warwick County Mental Hospital is at present suffering from this condition. The following details are, I think, of interest. During December of last year friends of the patient, A.B., purchased in a public market a green parrot. On Jan. 9th of this year—that is, after about a fortnight—this bird died. Its dead body was taken back to the vendor, who supplied a new bird. This one was carried back to Warwick by train in a cardboard box by A.B., who herself, when she reached her friends' house, actually transferred the parrot from the box to its cage. Next morning the parrot was found dead in its cage. Two members of the family were taken ill on Jan. 12th, and the third on the 19th. Besides actually handling the parrot in question A.B. had subsequently helped to nurse her ill friends on Jan. 15th. One of these died later.

A.B. herself first noticed symptoms on Jan. 19th. They were fever, nausea, vomiting, and backache. She did not report sick to us until Jan. 22nd, when she had all the symptoms above noted, an extremely dirty brown-coated tongue, a temperature of 104·0° F., and she looked very seriously ill. On Jan. 22nd a blood culture was done which turned out to be sterile. The leucocyte count was 20,400. Agglutination with standard Oxford cultures of *B. typhosus*, *B. paratyphosus* A, *B. paratyphosus* B, *B. ent.* Gaertner, gave negative results down to dilutions of 1 in 25. A dry, troublesome, cough started about Jan. 25th and there are small areas of consolidation in the lungs to account for this. The course of her case has been a steady constant temperature round about 103°F. for the first week, gradually coming down and the symptoms moderating more or less accordingly. The temperature actually touched normal for the first time on Feb. 1st, and is at the present time in the neighbourhood of 100°F. She still has feelings of nausea but the lung signs are clearing up and the patient's condition steadily improving. There has never been any splenic enlargement. On Jan. 25th the leucocyte count was 17,200 and on the 28th was 10,800 (polymorphs, 63 per cent.; lymphocytes, 35 per cent.; transitional, 2 per cent.). On the same day agglutination against the same four organisms mentioned above was again negative. The urine was sterile. No non-lactose-fermenting colonies were found on plates from the stools. On blood culture after 48 hours a growth was obtained in broth of a Gram-negative motile bacillus. Subcultured, this bacillus grew readily and copiously in 24 hours on an ordinary agar slope. It was markedly hæmolytic. It would not ferment glucose, lactose, saccharose, maltose, or mannite. Litmus milk remained alkaline after 24 hours, turning slowly acid after 48. There was no clotting. So far subcultures made each day have remained true to the above type except that the power to turn the litmus red is getting weaker. On Feb. 2nd the leucocyte count was 6100. An organism with apparently the same characteristics was grown from the urine.

I am, Sir, yours faithfully,

A. T. W. FORRESTER,
Medical Superintendent, Warwick County Mental Hospital.
Feb. 3rd, 1930.

SPINAL ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—I offer Dr. Falkner Hill an apology for misinterpretating him. The explanation of the escape of the phrenic motor roots when numbness in the neck follows a novocain injection, is, I believe, simple.

(1) The upper remnant of a heavy solution tends to affect the posterior roots more than the anterior.

(2) The concentration in the cervical region is too dilute to affect motor fibres.

If a small dose of novocain is injected across the cauda equina between L1–L2, pain sense in the leg is the first to go, then follow touch, muscular sense, and finally motor power. Return is in the reverse order, and an operation on the leg may continue after muscular control has returned. Motor fibres are more resistant and recover more easily than sensory. When after an injection a man is unable by voluntary effort to move his leg, the motor path is blocked as well as the sensory. During the recovery he can stimulate his muscles at will, but the afferent pain path remains blocked. Could this sequence be explained by receptor paralysis alone?

In the dorsal region, Dr. Falkner Hill can find no stimulus for the abdominal muscles, assuming that the efferent path becomes unlocked before the afferent. Are they not part of the normal respiratory mechanism, and do they not receive central stimuli? Failure to get a sufficient concentration of novocain on the anterior roots from D6 down accounts for statements that novocain does not give good relaxation and the early return of rigidity in the upper abdomen is but the natural consequence of a diminishing concentration of novocain from below upwards. The following case is instructive.

> Percain normal saline S.G. 1.006. Profound splanchnic block. Man, aged 62, carcinoma of the colon. Resection of terminal portion of ileum, cæcum, and part of ascending colon; lateral anastomosis. At 1 hour 15 minutes during the anastomosis patient complained of pain in the stomach, which persisted until its completion. With a novocain administration this pain would have been preceded by increasing rigidity, later accentuated by painful stimuli. But not so in this case; 20 minutes after pain was first felt the abdominal wall was perfectly relaxed, and was sewn up without the slightest difficulty. The receptors had recovered, but the motor mechanism was unable to respond. The solution was evidently lighter than the cerebro-spinal fluid, and had applied itself more to the anterior roots than to the posterior.

The contrast between the behaviour of these two types of solutions seems to provide some evidence that the roots are the site of the block.

Dr. Falkner Hill, criticising the controllability of *spinocain asks, "If expansion is essential for a high* anæsthesia, how is it that a high and long anæsthesia is produced when only 2 c.cm. of cerebro-spinal fluid have been extracted?" I would add to this, especially if "gliadin holds the solution together." I find that in order to pass the roots of D5 I must make a direct injection of between 15 and 20 c.cm. of solution between L1–L2. Can it be possible that after all spinocain is, or behaves in the same manner as a heavy solution? If 2 c.cm. of spinocain were quietly injected between L1–L2 without "expansion," would there be no advance on the thoracic nerve roots in the Trendelenburg position?

Dr. Falkner Hill writes: "Though this quality of lightness may be of no physical importance, in the present state of opinion it has a very definite psychological value." I have always regarded spinocain as a great achievement in practical psychology.

I am, Sir, yours faithfully,

London, W., Feb. 3rd, 1930. W. HOWARD JONES.

MENTAL TREATMENT BILL.

To the Editor of THE LANCET.

SIR,—In your issue of Feb. 1st (p. 263) Dr. S. E. White, commenting on a leading article dealing with amendment of the Lunacy Acts, states that—

> As regards transient cases of high temperature with delirium (e.g., puerperal, pneumonic, influenzal) it is very undesirable to treat such cases in asylums because there is there no qualified nursing staff competent to take charge of patients in such peril of their lives.

As one who has had 24 years' experience of mental hospitals I feel that I cannot allow such a statement to go uncontradicted. The statement is in fact so far removed from the truth that one can only conclude that Dr. White has no real knowledge or experience of what she is talking about. She is evidently ignorant of the fact that nurses in mental hospitals who enter for the mental section of the General Nursing Council's examination sit exactly the same preliminary examination as the general hospital nurse. She is also probably ignorant of the fact that facilities exist whereby the nurse who has passed the G.N.C. examination in the mental section can obtain her " general " certificate by two years further training at a general hospital, and that in the Devon Mental Hospital alone no less than five have already shown enough enthusiasm to take this extra course, and so become " doubly qualified."

But apart from this, cases of delirium are so commonplace in mental hospitals that it is absurd to allege that " asylum nurses " are incompetent to deal with them. A " certificated mental nurse " is in my opinion the best possible nurse to attend cases of delirium. She has at least been given special instruction in the psychological aspect of such conditions to which her sister in the general hospital pays little attention. The keenness shown by the mental hospital nurse in this way deserves praise and encouragement.—I am, Sir, yours faithfully,

RICHARD EAGER, O.B.E., M.D.,
Medical Superintendent, Devon Mental Hospital, Exminster.
Feb. 2nd, 1930.

THE CLAIMS OF LOURDES

To the Editor of THE LANCET.

SIR,—On page 196 of THE LANCET of Jan. 25th there appears an annotation headed " Austrian Thaumaturgist." One sentence in this article must have caused much astonishment and disgust in the minds of many of your readers. The sentence reads " the place is in fact a veritable Lourdes, which it resembles in the nature of the diseases cured, which are mainly of a neurotic type with a sprinkling of rheumatic and pseudo-paralytic affections."

I have rarely seen a short sentence which contains so many mis-statements, to use a mild term. I might ask in what possible way does the clinic of this thaumaturgist resemble the shrine of Our Lady of Lourdes, where pilgrims flock in scores of thousands to implore the intercession of the Blessed Virgin for the cure of their spiritual and corporal ills. Then, again, the remainder of the sentence is an absolute travesty of truth. The Bureau de Constatations Médicales at Lourdes is open to any medical man be his religious opinions what they may. These gentlemen are invited to examine and report on all cases claiming to be miraculous cures. Only after a thorough investigation and after the lapse of 12 months is a definite opinion passed on the fact of a miracle having occurred. Perhaps the most surprisingly inaccurate of all the statements contained in this marvellous sentence is that the majority of the cases cured at Lourdes are of the neurotic type, &c. It will perhaps amaze the author of this extraordinary statement to know that such cases are never claimed as miracles or are recorded as such by the Bureau at Lourdes.

In conclusion, I may say that, as a constant reader of your valuable periodical, I am astonished at the action of the Editor of THE LANCET in allowing such a travesty of truth to appear in a scientific journal.

I am, Sir, yours faithfully,
J. B. MOORE, M.B., F.R.C.S.I.
Belfast, Jan. 29th, 1930.

MEDICINES IN THE MASS.

To the Editor of THE LANCET.

SIR,—Your leading article on Medicines in the Mass reminds me that I once saw a patient who took so much medicine that the chemist called every day for orders.—I am, Sir, yours faithfully,

Jan. 29th, 1930. W. HALE-WHITE.

Parliamentary Intelligence.

HOUSE OF COMMONS

WEDNESDAY, JAN. 29TH.

Amendment of the Children Act, 1908.

Sir ROBERT GOWER asked the Minister of Health whether he was aware that the Medway board of guardians had passed a resolution urging His Majesty's Government to initiate legislation amending Part I. of the Children's Act, 1908, to the effect that it should be made compulsory upon intending foster parents to apply to the local authority concerned for the registration of their premises for the reception of nurse infants before the reception actually takes place; and whether he proposed to introduce such amending legislation.—Mr. GREENWOOD replied: The answer to the first part of the question is in the affirmative. This suggestion will receive consideration in connexion with any legislation for the amendment of the Children's Act, 1908, but I cannot give any date for the introduction of such legislation.

Air-gun Accidents among Children.

Mr. FREEMAN asked the Home Secretary whether, in view of the number of accidents from air-guns amongst small children, he would consider the desirability of limiting their use to the holders of a duly issued licence.—Mr. CLYNES replied: If the mischiefs to which the Firearms Act, 1920, was directed by Parliament were found to arise as regards air-guns, power already exists to impose the requirement of a firearm certificate, but those mischiefs do not arise, and I do not think sufficient ground exists for proposing legislation to set up a licensing system with other objects in view.

Naval Officers' Photographs.

Sir NICHOLAS GRATTAN-DOYLE asked the First Lord of the Admiralty whether, with regard to the instructions recently issued requiring all officers at certain stages of their naval careers to submit photographs of themselves to the Admiralty, he would state for what purposes those photographs were required; and at what stages of their naval careers officers had to submit them.—Mr. ALEXANDER replied that, so far as medical officers were concerned, the answer was: on entry and on promotion to surgeon-commander. Dental officers were required to submit photographs on entry and on attaining six years seniority as surgeon lieutenant-commander (D).

THURSDAY, JAN. 30TH.

Diagnosis of Silicosis.

Mr. CECIL WILSON asked the Home Secretary whether any and, if so, which of the recommendations of the departmental committee on the diagnosis of silicosis were to be adopted; and when it was anticipated that the central bureau would be set up.—Mr. CLYNES replied: I have approved generally the medical arrangements recommended by this committee, but I am advised that they cannot be given effect to without further legislation and a Bill is accordingly in preparation. I have already acted on the recommendation of the committee in favour of further research by arranging with the Medical Research Council for the appointment of an expert committee.

Fibrosis of the Lungs and Workman's Compensation.

Mr. MORLEY asked the Home Secretary what further steps had been taken towards scheduling fibrosis of the lungs under the Workmen's Compensation Act.—Mr. CLYNES replied: This is a big question on which I was advised that much further research would be necessary, and I therefore asked the Medical Research Council to set up an expert committee to institute and coördinate research into the subject. I am glad to say that the Council have agreed to do this, and are now engaged in setting up a committee. I understand that the committee is practically complete and will be appointed very shortly.

Defective Schools.

Mr. KINLEY asked the President of the Board of Education the number of voluntary schools listed as defective, or no longer suitable; and the number of children in average attendance at those schools.—Sir CHARLES TREVELYAN replied: The total number of voluntary schools remaining on the black list is 1323. The total number of children on the registers of these schools on March 31st last was 318,892.

Ministry of Health and Meat Extracts.

Mr. FREEMAN asked the Minister of Health whether his attention had been called to an advertisement appearing in many newspapers, and particularly on Saturday, Dec. 28th, 1929, in an evening paper, implying that the Health Ministry recommended certain meat extracts; whether the recommendation was given; and, if not, what action he proposed to take in the matter to dissociate the Ministry from such advertisements.—Mr. Greenwood replied: The answer to the first part of the question is in the affirmative. My department does not recommend this or any other meat extract. But the advertisement does not appear to contain any mis-statement of fact in regard to the Ministry of Health, and while I deprecate such a form of advertisement, I do not think that I can usefully take any action in the matter.

Psittacosis in Birmingham.

Mr. Hannon asked the Minister of Health whether his attention had been called to a recent statement by the medical officer of health for Birmingham that several cases of psittacosis, definitely caused by infection from parrots, had occurred in Birmingham within the past two years; and, seeing that of 11 cases reported in Birmingham during the period stated four had proved fatal, he would say what steps the Ministry had taken to deal with this malady.—Mr. Greenwood replied: I am informed that the medical officer of health of Birmingham has not made any public statement of the kind referred to. As regards the second part of the question, I would refer the hon. Member to the answer given on Jan. 23rd[1] to the hon. and gallant Member for Warwick and Leamington.

Mr. Hannon: Has the right hon. gentleman any information from Birmingham of the result of the inquiry which he has ordered to be made, and can he give any information as to what practical steps are being taken to put an end to this malady?

Mr. Greenwood: As I explained to the House, investigations are not complete.

Dr. Davies: Is the right hon. gentleman aware that both Germany and the United States have prohibited——

The Speaker: The hon. gentleman is giving information.

Birth Control.

Mr. Morley asked the Minister of Health how many local authorities had desired him to give consideration to the question of allowing municipalities to provide facilities for reliable and private information as to the methods of family limitation.—Mr. Greenwood: Fifty-five.

Mr. Morley: Will the right hon. gentleman inform the House if and when he is prepared to grant these facilities?

No answer was given.

Vaccination Exemptions.

Mr. Thomas Lewis asked the Minister of Health the number of children exempted from vaccination on conscientious grounds during 1929.—Mr. Greenwood replied: The number of statutory declarations of conscientious objection received by the vaccination officers in England and Wales during the calendar year 1928 was 277,169. The figure for 1929 is not yet available.

Extension of National Insurance.

Mr. George Oliver asked the Minister of Health whether it was the intention of the Cabinet committee charged to inquire into the subject of national insurance and pensions to consider the extending of insurance to persons who, by reason of occupation or income, were excluded from the present schemes of insurance.—Mr. Greenwood replied: The question referred to by the hon. Member will be considered by the Cabinet committee.

Medical Practitioners and Death Certification.

Sir George Penny asked the Minister of Health whether he would take steps to make it obligatory upon a medical practitioner to view a body after death before giving a death certificate.—Mr. Greenwood replied: This subject was fully discussed during the passage through this House of the Births and Deaths Registration Act of 1926; and I am not prepared to introduce further legislation in present circumstances.

Leprosy in India.

Major Graham Pole asked the Secretary of State for India the number of known cases of leprosy in India, and how many of these were segregated either in their homes or in institutions; whether the Government took any steps to effect their compulsory segregation either in their homes or in institutions; and what was the number of leper institutions in India and the total amount contributed out of Indian revenues towards the extinction of this disease.—Mr. Wedgwood Benn replied: The number of persons in India returned as lepers at the census of 1921, the last official figure available, was 102,513, but it is probable that the number is considerably in excess of that returned. There are about 40 institutions with about 8000 inmates. The Indian Lepers Act provides that the compulsory segregation of pauper lepers may be enforced in areas to which the Act is made applicable by the provincial governments, but the total number of compulsorily segregated lepers is at present inconsiderable. The number of lepers segregated in their homes, and the total amount contributed from Indian revenues cannot be stated.

The following note has been supplied by Sir Leonard Rogers: "Any attempt at general compulsory segregation is impossible on account of the prohibitive cost, and now that the improved treatment enables most early, but few advanced, cases to be cleared up, compulsion does more harm than good by causing the early, largely uninfective, cases to be hidden until they have become advanced, infectious, and incurable. At the present time about one hundred doctors are being trained in the modern treatment at the Calcutta School of Tropical Medicine, and thousands of lepers are now being treated by them all over India at clinics with far greater effect in reducing leprosy than attempts at segregation, which have invariably proved very expensive failures in all tropical countries where they have been tried."

MONDAY, FEB. 3RD.

All-India Medical Council.

Major Graham Pole asked the Secretary of State for India if it was the intention of the Government to take early steps towards the establishment of an all-India medical council.—Mr. Wedgwood Benn replied: The Government of India are anxious to introduce the necessary legislation at the earliest possible date, but it is doubtful whether this will be possible during the present session of their Legislature.

Lieut.-Colonel Fremantle asked the right hon. gentleman to do his utmost to impress on the Government of India that, unless there was reciprocity between the two Governments and the two medical councils, Indian practitioners would be debarred from the possibility of practice throughout the rest of the British Empire; and that it was therefore extremely important to keep the General Medical Council and the Council in India working together.—Mr. Benn replied that the Government of India were fully aware of the facts mentioned by Colonel Fremantle.

Central Research Institute in India.

Major Graham Pole asked the Secretary of State for India the intention of the Government of India towards the proposal to remove the Central Research Institute to Dehra Dun, in view of the fact that there would be an absence of the clinical facilities and the scientific coöperation available in larger urban areas.—Mr. Wedgwood Benn replied: The Government of India have decided after full consideration to adhere to the proposal to locate the Institute at Dehra Dun. Their reasons were explained in the course of a debate in the Council of State on Sept. 17th.

Small-pox Deaths in India.

Mr. Freeman asked the Secretary of State for India how many small-pox deaths were registered in each of the cities of Calcutta, Bombay, and Madras in the years 1925, 1926, 1927, and 1928, respectively; and what was the infant mortality-rate in each city for the same years.—Mr. Wedgwood Benn replied: The following tabular statement contains the figures:—

—	Small-pox deaths.				Infant mortality death-rate per 1000.			
	1925	1926	1927	1928	1925	1926	1927	1928
Calcutta ..	3923	934	2860	N.r.	326	372	340	N.r.
Bombay ..	565	476	841	595	359	394	319	314
Madras ..	762	60	32	246	281	282	240	289

N.r.—Not yet received.

Local Government Act, 1929.

Mr. West asked the Minister of Health whether he had received any representations from the Metropolitan Boroughs Standing Joint Committe with reference to the scheme which he proposed to make, under Section 101 (6) of the Local Government Act, 1929; and whether he was satisfied that under that Act he was authorised to confer on the London County Council the supervisory powers over certain voluntary associations which were specified in paragraph 3 of the proposed scheme.—Miss S. Lawrence replied: The answer to both parts of the question is in the affirmative.

TUESDAY, FEB. 4TH.

After-care of Mental and Physical Defectives.

Dr. Forgan asked the Secretary of State for Scotland if, in view of the value of the work being carried out in Scotland by after-care committees in connexion with mental and physical defectives, he would consider the advisability of increasing the average annual Government grant of £18 to removed from the truth that one can only conclude that Dr. White has no real knowledge or experience of what she is talking about. She is evidently ignorant of the fact that nurses in mental hospitals who enter for the mental section of the General Nursing Council's examination sit exactly the same preliminary examination as the general hospital nurse. She is also probably ignorant of the fact that facilities exist whereby the nurse who has passed the G.N.C. examination in the mental section can obtain her "general" certificate by two years further training at a general hospital, and that in the Devon Mental Hospital alone no less than five have already shown enough enthusiasm to take this extra course, and so become "doubly qualified."

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[1] The Lancet, Feb. 1st, p. 268.

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RICHARD EAGER, O.B.E., M.D.,
Medical Superintendent, Devon Mental Hospital, Exminster.
Feb. 2nd, 1930.

THE CLAIMS OF LOURDES

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SIR,—Your leading article on Medicines in the Mass reminds me that I once saw a patient who took so much medicine that the chemist called every day for orders.—I am, Sir, yours faithfully,

Jan. 29th, 1930. W. HALE-WHITE.

Parliamentary Intelligence.

HOUSE OF COMMONS

WEDNESDAY, JAN. 29TH.

Amendment of the Children Act, 1908.

Sir ROBERT GOWER asked the Minister of Health whether he was aware that the Medway board of guardians had passed a resolution urging His Majesty's Government to initiate legislation amending Part I. of the Children's Act, 1908, to the effect that it should be made compulsory upon intending foster parents to apply to the local authority concerned for the registration of their premises for the reception of nurse infants before the reception actually takes place; and whether he proposed to introduce such amending legislation.—Mr. GREENWOOD replied: The answer to the first part of the question is in the affirmative. This suggestion will receive consideration in connexion with any legislation for the amendment of the Children's Act, 1908, but I cannot give any date for the introduction of such legislation.

Air-gun Accidents among Children.

Mr. FREEMAN asked the Home Secretary whether, in view of the number of accidents from air-guns amongst small children, he would consider the desirability of limiting their use to the holders of a duly issued licence.—Mr. CLYNES replied: If the mischiefs to which the Firearms Act, 1920, was directed by Parliament were found to arise as regards air-guns, power already exists to impose the requirement of a firearm certificate, but those mischiefs do not arise, and I do not think sufficient ground exists for proposing legislation to set up a licensing system with other objects in view.

Naval Officers' Photographs.

Sir NICHOLAS GRATTAN-DOYLE asked the First Lord of the Admiralty whether, with regard to the instructions recently issued requiring all officers at certain stages of their naval careers to submit photographs of themselves to the Admiralty, he would state for what purposes those photographs were required; and at what stages of their naval careers officers had to submit them.—Mr. ALEXANDER replied that, so far as medical officers were concerned, the answer was: on entry and on promotion to surgeon-commander. Dental officers were required to submit photographs on entry and on attaining six years seniority as surgeon lieutenant-commander (D).

THURSDAY, JAN. 30TH.

Diagnosis of Silicosis.

Mr. CECIL WILSON asked the Home Secretary whether any and, if so, which of the recommendations of the departmental committee on the diagnosis of silicosis were to be adopted; and when it was anticipated that the central bureau would be set up.—Mr. CLYNES replied: I have approved generally the medical arrangements recommended by this committee, but I am advised that they cannot be given effect to without further legislation and a Bill is accordingly in preparation. I have already acted on the recommendation of the committee in favour of further research by arranging with the Medical Research Council for the appointment of an expert committee.

Fibrosis of the Lungs and Workman's Compensation.

Mr. MORLEY asked the Home Secretary what further steps had been taken towards scheduling fibrosis of the lungs under the Workmen's Compensation Act.—Mr. CLYNES replied: This is a big question on which I was advised that much further research would be necessary, and I therefore asked the Medical Research Council to set up an expert committee to institute and coördinate research into the subject. I am glad to say that the Council have agreed to do this, and are now engaged in setting up a committee. I understand that the committee is practically complete and will be appointed very shortly.

Defective Schools.

Mr. KINLEY asked the President of the Board of Education the number of voluntary schools listed as defective, or no longer suitable; and the number of children in average attendance at those schools.—Sir CHARLES TREVELYAN replied: The total number of voluntary schools remaining on the black list is 1323. The total number of children on the registers of these schools on March 31st last was 318,892.

Ministry of Health and Meat Extracts.

Mr. FREEMAN asked the Minister of Health whether his attention had been called to an advertisement appearing in many newspapers, and particularly on Saturday, Dec. 28th, 1929, in an evening paper, implying that the Health Ministry

Univ. Coll.; Alison J. Rae, Royal Free; D. S. Raju, Madras and Guy's; H. Ramsay, Middlesex; P. V. Reading, Guy's; J. G. Reid, Oxford and St. George's; B. C. Rennie, Otago; Colleen Rice, Charing Cross; J. F. Riches, St. Thomas's; E. H. Rink, Oxford and Guy's; S. L. Robert, Bombay and Birmingham; B. P. Robinson, Manchester; Alice I. Roughton, Cambridge; H. K. Said, Cairo and Charing Cross; J. F. Sandow, Middlesex; N. D. Sane, Bombay and London: S. Segalov, St. Bart.'s; R. L. Sethi and D. P. Settna, Bombay and London; G. C. Sheldon, King's Coll.; Helana Sidarous, Royal Free; H. Silverstein, St. Bart.'s; Margaret Skelton, Univ. Coll.; L. A. H. Snowball, King's Coll.; R. G. Sowter, Guy's; H. H. L. Spitz, Leipzig and Middlesex; B. T. Squires, Oxford and Guy's; R. Stanley, Birmingham and St. Thomas's; A. E. Stevens, London; E. N. Stevens, Guy's; N. Stevens, Cambridge and St. Thomas's; F. H. Stevenson, Guy's; Ada M. W. Stewart, Liverpool and Univ. Coll.; T. S. Stone, London; S. Le R. Switzer, Cambridge and London; P. H. Taylor, King's Coll.; D. M. Thomas, Middlesex and Cardiff; V. Thorne Thorne, Cambridge and St. Bart.'s; D. P. Turner, King's Coll.; S. C. Wake, Bristol; Doris E. C. Walker, Univ. Coll.; E. M. Ward, St. Bart.'s; J. N. Warren, Cambridge and London; A. J. Whitaker, Univ. Coll.; A. J. White, Middlesex: G. W. Whittall, Cambridge and St. Thomas's; R. C. Williams, St. Thomas's; E. R. Willis, London; H. M. Yardley, Cambridge and St. Thomas's; and B. Yuill, Toronto and London.

The undermentioned diplomas were conferred jointly with the Royal College of Surgeons upon the following candidates:—

DIPLOMA IN PUBLIC HEALTH.

D. D. Anderson, S. Atta Ullah, B. N. V. Bailey, M. K. Biswas, Gwenddolen J. Brooke, Izza Caley, H. D. Chalke, Victoria M. Crosse, Jane G. E-F. Cummins, N. C. Dasgupta, A. N. Duggal, J. B. Ellison, R. F. Fidler, S. J. Firth, Annie M. Gamble, T. S. Gill, S. A. Haque, L. W. Hearn, G. H. Hogben, J. D. Hourihane, D. F. Johnstone, M. L. Kalra, Y. M. Khan, R. A. V. Lewys-Lloyd, E. A. Lumley, R. M. Macfarlane, M. Mitman, S. K. Mitra, P. McG. Moffatt, C. G. M. Nicol, P. Pattabhiramaiya, J. R. Pierre, S. L. Rikhye, Dora F. M. Rose, A. C. Sinclair, E. R. Smithard, R. C. Suri, H. W. Tilling, P. M. Wagle, and Ethel M. Weir.

DIPLOMA IN LARYNGOLOGY AND OTOLOGY.

W. M. Brown, S. Debono, D. N. Ghosh, G. B. Girgis, S. K. Jatar, V. Kathirgamatamby, J. G. Kingsbury, F. E. Littlewood, M. MacGregor, N. M. Macindoe, H. G. Mitchell, J. H. Otty, M. D. Patel, D. R. Paterson, P. Pattabhiramaiya, T. Prasad, D. H. Rao, and S. L. Vella.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

D. I. Cameron, J. Carse, H. A. Cooper, R. T. Hay, J. F. MacMahon, J. D. W. Pearce, Margaret A. Quine, A. Shepherd, J. G. T. Thomas, G. S. Wilson, and H. L. Wilson.

UNIVERSITY OF LONDON.—At a meeting of the Senate on Jan. 29th the degree of D.Sc. in Zoology was awarded to Mr. E. A. Spaul for a thesis on the Activity of the Anterior Lobe Pituitary.

Dr. H. A. Harris, assistant professor of anatomy at University College; and assistant to the medical unit at University College Hospital, was awarded the William Julius Mickle Fellowship for 1930 in respect of research on problems of growth in man and animals. This Fellowship is given annually to the graduate of the University who is held to have done most to advance medical art or science in the preceding five years.

Mr. H. L. Eason was reappointed representative of the University on the General Medical Council.

A Diploma in Public Health for External Students was established.

University College.—A course of six public lectures on Antiseptics will be given by Mr. H. R. Ing, D.Phil., on Mondays and Thursdays at 5.15 P.M., beginning on Feb. 13th.

ASSOCIATION OF CLINICAL PATHOLOGISTS.—The third annual meeting of the British Pathologists' Association was held in the Pathological Department, University College Hospital Medical School, on Jan. 26th. The morning session was devoted to the consideration of the Technique and Interpretation of the Fractional Test Meal. Communications were made by Dr. E. Christine Emma Pillman-Williams, who described the technique of the withdrawal and analysis of the meal, and by Dr. G. W. Goodhart, who dealt at length with the interpretation of results. Dr. Goodhart laid special stress upon the importance of the determination of the chlorides, and expressed the opinion that the findings could best be accounted for on the assumption of regurgitation of alkaline duodenal contents. Both papers were followed by lively discussion. During the afternoon session demonstrations were given as follows: by Dr. H. D. Wright, medium for growing pneumococci; hæmolytic power of streptococci. Dr. G. W. Goodhart, diphtheria of the vulva; pernicious anæmia without achlorhydria. Dr. D. Embleton, blood from recovered case of agranulocytic angina. Dr. G. W. Barnard, hearts injected to show the coronary circulation; hearts showing coronary thrombosis. Prof. Hadfield, specimens from case of Lindau's disease, and other pathological specimens. At the general meeting it was decided to change the name of the association to the Association of Clinical Pathologists.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—A provincial meeting of the maternity and child welfare group will be held at Bristol from Feb. 20th to 22nd. The hon. secretary's address is 1, Holly-terrace, Highgate, London, N. 6.

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.—The annual general meeting of this association will be held at 11, Chandos-street, Cavendish-square, London, W., on Friday, Feb. 21st, at 5 P.M., when Dr. G. E. Friend will deliver a presidential address, entitled Some Notes on the Value of Clinical, Dietetic, and Physical Records in Public Schools.

POST-GRADUATE COURSE IN ORTHOPÆDIC SURGERY.—A special fortnight's course will be held at the Royal National Orthopædic Hospital, Great Portland-street, London, W. 1, from March 10th to 22nd. Those taking the course will have access to operations and the practice of the hospital. Application should be made to the secretary of the hospital, or to the secretary of the Fellowship of Medicine, at 1, Wimpole-street, W.1.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—A dinner in honour of Dr. Heinrich Neumann, professor of otology in the University of Vienna, will be given by this society at the First Avenue Hotel, High Holborn, London, on Sunday, Feb. 9th, at 7.15 for 8 P.M. Application should be made to Mr. M. Sourasky at 59, Queen Anne-street, W.1.

INTERNATIONAL SOCIETY FOR MICROBIOLOGY.—The first international Congress organised by this society will be held in Paris from July 20th to 25th. Those who desire to take part, whether members of the society or not, should send a subscription of 100 French francs to the Treasurer of the Congress, M. Georges Masson, 120, Boulevard Saint-Germain, Paris (VI^e). Notification for enrolment will be received up to June 15th.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL.—The committee of management has decided to appoint a pædiatrician to the staff of this hospital, and Dr. Eric Pritchard has, at their invitation, accepted this office. It is understood that this appointment will not conflict with Dr. Pritchard's work as Medical Director of the Infants Hospital. Dr. J. Hartley Gibbens has been appointed assistant to Dr. Pritchard at Queen Charlotte's.

ANIMAL DISEASES RESEARCH INSTITUTE.—Mr. John Russell Greig, Ph.D., professor of medicine and materia medica in the Royal (Dick) Veterinary College, Edinburgh, has been appointed Director of the Institute at Moredun in succession to Mr. W. A. Pool, who is now Deputy Director of the Imperial Bureau of Animal Health at Weybridge.

NEW NURSES' HOMES.—The new nurses' home at Crumpsall Infirmary, Manchester, was formally opened last week by Mr. Hugh Fay, Chairman of the Manchester Board of Guardians. The building, which has cost £80,000, will accommodate 220 nurses.—A home for the nurses of Forfar Infirmary, built with an allocation from the estate of the late Sir James Duncan, was also opened last week.

SUN-BATHING IN MANCHESTER.—The Manchester Parks Committee have decided that Platt Fields should be the first park in which sun-bathing may be combined with open-air bathing. The necessary alterations will be made so that sun-bathing may be begun at the end of May (weather permitting). People will be able to go to Platt Fields and take sun-baths on the sand in bathing costumes.

REDLANDS HOSPITAL FOR WOMEN.—This Glasgow hospital has just been enlarged by the incorporation of an adjoining house which will accommodate 22 maternity cases. The object of the maternity extension is to provide efficient treatment for expectant mothers able to pay a fee ranging from 3½ to 6 guineas a week.

ADDENBROOKE'S APPEAL.—Last week Sir Humphry Rolleston broadcast an appeal from 5XX for the building fund of Addenbrooke's Hospital, Cambridge. He stated that of the £90,000 required only about one-third had yet been raised.

LERWICK HOSPITAL.—It is hoped to raise £10,000 to enlarge and a further £10,000 to endow the Lerwick Hospital which serves the Shetland Islands. Last year there were 339 in-patients and 882 out-patients, the operations numbered 481, and the percentage of deaths was 4·39.

DUNFERMLINE AND WEST FIFE HOSPITAL.—The Managers report that the cost per occupied bed had increased last year from £98 9s. 4d. to £103 17s. 6d.; there was a surplus on the year's working of £2628. An important extension, for which over £51,000 has been raised, will be ready for occupation at the beginning of next month.

London Clinic for Rheumatism.—On Feb. 25th the Queen will open the new clinic for the treatment of rheumatism which is being established by the British Red Cross Society in Regent's Park, London. It is stated that the clinic will be capable of dealing with 400 cases a day. It will provide treatment: (1) for workers insured under the National Health Insurance Acts, and (2) for men and women able and willing to pay a reasonable fee. There will be a resident medical officer and a visiting staff of physicians and surgeons.

Dinner to Nobel Laureates.—Sir Charles Martin presided at a dinner given in London by the Biochemical Society on Feb. 3rd in honour of the Nobel Laureates in Chemistry and Medicine for the past year. Sir Frederick Hopkins, Prof. Hans von Euler, and Prof. Arthur Harden responded briefly to the toast proposed by the chairman, and seconded by Prof. G. Barger. The fourth Laureate, Prof. C. Eijkman, was unable to be present owing to ill-health. The Swedish Minister and the President of the Royal Society responded to the toast of the Guests, proposed by Sir William Hardy.

Royal Medical Benevolent Fund.—At meetings of the Committee in December and January a total of £2379 was voted in 113 cases in which help was required by medical men or by their widows or families. The following are particulars of five of these cases:—

Widow, aged 50, of L.R.C.P.&.S. whose husband died suddenly in September, 1929, at the age of 51 from heart failure. The widow who is in very delicate health was left an income of £50 p.a. and children dependent on her. Voted Grant of £36 and a special gift of £14.

M.D., aged 60, married, suffering from tuberculosis and in a Sanatorium. Practice has been sold and when proceeds are invested will give an income of £135. Applicant has one son and two daughters. Two eldest have secured posts. Voted £40.

Widow, aged 60, of M.R.C.S. Her husband suffered from ill-health all his life and was never able to work enough to save any money. At his death in November the widow and one daughter were left with a capital of £200. The daughter has been trained and will obtain employment. Voted £26 and special gift of £10.

Two daughters, aged 61 and 58, of L.F.P.S. Only income is £17 each, gifts from friends and deposit interest on the sum of £57. Voted £36 each.

Daughter, aged 70, of M.R.C.S. Has been in bed during the whole of the last 12 months. Income from charities £30; old age Pension £26. Voted £30.

The Committee appeals urgently for subscriptions, donations, and legacies. Cheques should be sent to the hon. treasurer of the Fund at 11, Chandos-street, W.1.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Monday, Feb. 10th.—5 p.m., United Services (late War Section). Paper: Wing.-Comdr. H. A. Treadgold: Cardiac Functional Efficiency in the Young Male Adult.

Tuesday.—5 p.m., Therapeutics and Pharmacology. An informal Discussion on the Treatment of Uræmia. Opener: Prof. F. Langmead. Members of the Sections of Urology, Medicine, and Disease in Children are specially invited to attend and take part in the Discussion. 8.30 p.m., Psychiatry and Neurology. Discussion on the Diagnosis and Treatment of the Milder Forms of the Manic-depressive Psychosis. Openers: Sir Farquhar Buzzard, Dr. George Riddoch, Dr. W. R. Reynell, and Dr. Neill Hobhouse (Neurology, Dr. Crichton Miller, Dr. Maurice Wright, and Dr. Helen Boyle (Psychiatry).

Wednesday.—5.30 p.m., Surgery: Subsection of Proctology. Discussion on Factors Making for Safety in the Surgery of the Colon and Rectum. Opener: Mr. G. Gordon-Taylor. Followed by Sir Charles Gordon-Watson, Mr. Ivor Back, Mr. Lionel Norbury, Mr. W. B. Gabriel, Mr. Lawrence Abel, and others.

Thursday.—8.30 p.m., Neurology. Short Papers: Dr. S. A. K. Wilson: The Relation of Nervous Symptoms to Nervous Lesions. Dr. E. Arnold Carmichael and Mr. J. Paterson Ross: Radium and Nervous Tissue; an Experimental Study.

Friday.—5.30 p.m., Clinical. *(Cases at 4.30 p.m.). Cases:* Mr. Philip Turner: 1. A Case of Von Recklinghausen's Disease. Mr. Cecil P. G. Wakeley: 2. Case of Fracture of Cervical Spine. 3. Case of Dislocation of the Carpal Semilunar. 4. Köhler's Disease with "Mulberry" Femoral Epiphyses. 5. Tuberculous Ulcer of Tongue. Dr. Bernard Myers: 6, 7 and 8. Three Cases of Purpura. 9. Case of Spina Bifida. Mr. Paul Bernard Roth: 10. Unusual Case of Loose Body in Each Knee-joint of Traumatic Origin. Dr. F. Parkes Weber and Dr. O. B. Bode: 11. Facial Lipodystrophia with Unerupted Upper Central Incisor Teeth. 12. Alopecia Totalis after Slight Nervous Shock. Mr. Harold Edwards: 13. Case of Cutaneous Growth of Keloid Nature (for Diagnosis). 14. Cyst of the Neck of the Femur in a Child. Mr. R. Rutherford: 15. Case of Schlatter's Disease. 16 and 17. Two Cases of Multiple Exostoses in a Family. Dr. Harold Avery: 18. A Case of the Jaw-winking Reflex. 19. Case of Rumination in Man. 20. Advanced Osteo-arthropathy in a Case of Pulmonary Neoplasm. Mr. A. E. Mortimer-Woolf: 21. Case of Osteitis Deformans with Sarcoma. Dr. Terence East: 22. Case of Splenic Enlargement of Obscure Origin. 8 p.m., Ophthalmology. Papers: Mr. Foster Moore: Unusual Coloration of Sclerotics. Mr. Ransom Pickard: The Red Field and Optic Disc Resistance in Glaucoma and Allied Conditions. Cases: Mr. J. H. Doggart: A Case of Distichiasis. Mr. A. F. MacCallan: Binocular Detachment of Retina in a Boy Aged 8. Other Cases will be shown.

BIOCHEMICAL SOCIETY.

Monday, Feb. 10th.—3.30 p.m. (at the Lister Institute, Chelsea Bridge-road, S.W.). Demonstrations. Papers *at 5 p.m.*

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

Friday, Feb. 14th.—4 p.m., Prof. E. W. Hey Groves: Hero Worship in Surgery. (Hunterian Oration.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, Feb. 10th, to Saturday, Feb. 15th.—Medical Society (Lecture Room), 11, Chandos-street, Cavendish-square, W. Tues., at 4 p.m., Lecture by Dr. M. B. Ray on the Rôle of Hydrology in Medical Practice. No fee.—Cancer Hospital, Fulham-road, S.W. Thurs., at 2.15 p.m., Demonstration by Mr. Cecil Rowntree. No fee.—Paddington Green Children's Hospital, Paddington Green, W. Fri., at 4 p.m., Lecture-demonstration by Dr. D. W. Winnicott on Anxiety in Children. No fee.—Chelsea Hospital for Women, Arthur-street, S.W. Special course in Gynæcology, lectures and demonstrations in the operating theatre.—Hospital for Tropical Diseases, 25, Gordon-street, W.C. Post-graduate course in Tropical Medicine. Tues. and Thurs. afternoons at 2 p.m.—Bethlem Royal Hospital, St. George's Fields, S.E. Course in Psychological Medicine. Lecture-demonstrations on Tues. and Sats. at 11 a.m. *Further particulars from the Fellowship of Medicine.*

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.

Monday, Feb. 10th.—10 a.m., Dr. Dowling: Skin Department. 11 a.m., Mr. Tyrrell Gray: Surgical Wards. 2 p.m., Mr. Sinclair: Surgical Wards.

Tuesday.—10 a.m., Medical Registrar: Medical Wards. 2 p.m., Mr. Hamblen Thomas: Throat, Nose, and Ear Dept. 2.30 p.m., Sir Henry Simson: Gynæcological Operations.

Wednesday.—10 a.m., Dr. Burnford: Medical Wards. 2.30 p.m., Mr. Donald Armour: Surgical Wards. Dr. Scott Pinchin: Medical Out-patients.

Thursday.—11.30 a.m., Mr. Simmonds: Demonstration of Fractures. 2 p.m., Mr. Bishop Harman: Eye Department. 2 p.m., Mr. MacDonald: Genito-Urinary Department.

Friday.—10 a.m., Dr. Pritchard: Medical Wards. 2 p.m., Mr. Vlasto: Throat, Nose, and Ear Department, 2 p.m., Mr. Sinclair: Operations.

Saturday.—9 a.m., Mr. Vlasto: Throat, Nose, and Ear Operations. 9.30 a.m., Dr. Burnford: Bacterial Therapy Department. 10 a.m., Dr. Owen: Medical Children's Department.

Daily, 10 a.m. to 5 p.m., Medical, Surgical and Special *Out-patients. Operations.* Ward *Visits. Anæsthetic* Courses.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

Monday, Feb. 10th.—2.30 to 5 p.m.: Medical, Surgical, and Gynæcological Clinics. Operations.

Tuesday.—2.30 to 5 p.m.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.

Wednesday.—2.30 to 5 p.m.: Medical, Skin, and Eye Clinics. Operations.

Thursday.—11.30 a.m.: Dental Clinics. 2.30 to 5 p.m.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

Friday.—10.30 a.m.: Throat, Nose and Ear Clinics. 2.30 to 5 p.m.: Surgical, Medical, and Children's Diseases Clinics. Operations.

CHADWICK PUBLIC LECTURE.

Thursday, Feb. 13th.—5.15 p.m. (in the Lecture Hall of the Medical Society of London, 11, Chandos-street, Cavendish-square, W.), Prof. B. Blacklock: Health in West Africa.

UNIVERSITY COLLEGE, Gower-street, W.C.

Monday, Feb. 10th.—5 p.m., Prof. A. V. Hill: Oxygen and the Recovery Process in Muscle and Nerve.

ROYAL NORTHERN HOSPITAL, Holloway.

Tuesday, Feb. 11th.—3.15 p.m., Dr. C. C. Beatty: *Demonstration of Cases.*

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

Monday, Feb. 10th.—1.30 p.m., Hearing Tests.

Wednesday.—1.30 p.m., The Sinuses: Examination and Diagnosis.

Friday.—4 p.m., Mr. J. D. McLaggan: Some *Complications* of Nasal Sepsis.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.

Wednesday, *Feb. 12th.*—4 p.m., Dr. J. Browning Alexander: The Investigation of Dyspeptic Conditions.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark Hill, S.E.

THURSDAY, Feb. 13th.—9 P.M., Dr. R. D. Lawrence: The Clinical Value of Chemical Investigations.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Feb. 11th.—5 P.M., Dr. E. Graham Little: Ulcus Molle.

THURSDAY.—5 P.M., Dr. J. E. M. Wigley: Lupus Erythematosus.

ST. MARY'S HOSPITALS, Manchester.

FRIDAY, Feb. 14th.—4.30 P.M. (at the Whitworth-street West Branch), Post-graduate Lecture, Dr. J. F. Ward: Vomiting in Infancy and Early Childhood.

SHEFFIELD POST-GRADUATE CLINICS.

TUESDAY, Feb. 11th.—3.30 P.M. (at the Jessop Hospital), Mr. King: Practical Antenatal Care and Its Limitations.

FRIDAY.—3.30 P.M. (at the Royal Infirmary), Mr. W. J. Lytle: Stone in the Urinary Tract.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

WEDNESDAY, Feb. 12th.—4.15 P.M. (at the Ear, Nose, and Throat Hospital), Cases by the Staff.

Appointments.

EDEN, G., M.D., B.Ch. Camb., has been appointed Hon. Physician to the Queen's Hospital, Birmingham.

LAWRIE, J. H. D., M.D. Edin., D.P.H., Medical Officer of Health for Macclesfield.

LILICO, G., M.B., Ch.B. Edin., D.P.H. Medical Officer of Health for Derby.

Vacancies.

For further information refer to the advertisement columns.

Abergele Sanatorium, North Wales.—Temporary Med. Supt. 15 gns. a week.

Barrow-in-Furness, North Lonsdale Hospital.—H.S. £150.

Bedford County Hospital.—H.S. At rate of £175.

Birmingham City and University, Joint Board of Research for Mental Disease.—Histological Asst. £4 weekly.

Birmingham General Hospital.—Res. Surg. Reg. £120–£140.

Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £150.

Bristol Eye Hospital.—H.S. £150.

British Red Cross Society, Clinic for Rheumatism, Regent's Park.—Clin. Pathologist (part-time). £250.

Burnley, Victoria Hospital.—H.P. At rate of £125.

Buxton, Devonshire Hospital.—Asst. H.P. At rate of £150.

Carlisle, Cumberland Infirmary.—H.P. Also H.S. to Special Depts. Each at rate of £155.

Carlisle, Cumberland and Westmorland Mental Hospital.—Deputy Med. Supt. £500.

Chelsea Health Soc. and School for Mothers.—M.O.

Chester Royal Infirmary.—H.S. £150.

Coventry and Warwickshire Hospital.—Hon. Asst. Dental Surg.

Croydon County Borough.—Asst. M.O., &c. £600.

Derby, Bretby Hall Orthopædic Hospital.—Asst. M.O. At rate of £150.

Derby, Derbyshire Education Committee.—Asst. School M.O. £600.

Derby, Derbyshire Royal Infirmary.—Ophth. H.S. H.S. Also Asst. H.S. Each £150.

Doncaster, Royal Infirmary.—Third H.S. At rate of £150.

Durham C.C.—Deputy County M.O.H. £1000.

Ealing, Borough of.—Asst. M.O.H. £600.

East Ham Memorial Hospital, Shrewsbury-road, E.—Hon. Asst. Ophth. S.

Gloucester County and City Mental Hospitals.—Med. Supt. £1100.

Golden Square Throat, Nose and Ear Hospital, W.—H.S. £100.

Great Yarmouth General Hospital.—Sen. H.S. £150.

Hackney Union Hospital, High-street, Homerton, E.—Dental S. £100.

Hornsey Borough.—Asst. M.O.H. and Asst. School M.O. £600.

Hull Royal Infirmary.—Cas. H.S. At rate of £130.

Infants Hospital, Vincent-square, Westminster, S.W.—Clin. Asst. for Out-Patient Dept.

Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £150.

King's Lynn, West Norfolk and King's Lynn Hospital.—Hon. Physician.

Leeds, Tuberculosis Sanatorium, Killingbeck.—Asst. Res. M.O. £250.

Liverpool, Royal Liverpool Children's Hospital, Myrtle-street.—Res. Cas. O. £250.

Liverpool, Royal Children's Hospital.—Two Res. H.P.'s and two Res. H.S.'s. Each at rate of £60. Also Res. M.O. at Heswall Branch. At rate of £120.

London Jewish Hospital, Stepney Green, E.—Cas. O. At rate of £150.

Macclesfield General Infirmary.—Second H.S. At rate of £150.

Maidstone, Kent County Ophthalmic and Aural Hospital.—H.S. to Ear, Nose and Throat Dept. At rate of £200.

Maidstone, West Kent General Hospital.—H.S. At rate of £220.

Manchester, Ancoats Hospital.—Orthopædic H.S. Also H.P. Each at rate of £100.

Manchester Royal Infirmary.—Three Clin. Assts. Each £35 for six months.

Manchester, Victoria Memorial Jewish Hospital, Cheetham.—Anæsthetist. One gn. per session.

Manchester and Salford Hospital for Skin Diseases.—H.S. £100.

Margate, Royal Sea Bathing Hospital for Surgical Tuberculosis.—Radiologist. 100 guineas.

Miller General Hospital, Greenwich, S.E.—Res. M.O., Cas. O. and H.P. At rate of £250, £150, and £125 respectively.

Newcastle-on-Tyne, Wooley Sanatorium, near Hexham.—Asst. M.O. £350.

Norwich, Norfolk and Norwich Hospital.—H.S. £120.

Nottingham Hospital for Women.—H.S. At rate of £150.

Oswestry, Shropshire Orthopædic Hospital, and Agnes Hunt Hospital.—H.S. At rate of £200.

Plymouth, South Devon and East Cornwall Hospital.—Hon. Asst. S. to Obstet., &c. Dept.

Royal Northern Hospital, Holloway.—H.S. Also Res. Out-patient Cas. O. and Anæsthetist. Each at rate of £70.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.P. At rate of £100.

St. Bartholomew's Hospital, E.C.—Dental H.S. £80. Also three Asst. Dental S's.

St. John's Hospital, St. John's Hill, Wandsworth, S.W.—Second Asst. Res. M.O. £100.

St. Mark's Hospital for Cancer, Fistula, &c., City-road, E.C.—H.S. At rate of £75.

Salford Royal Hospital.—H.S. to Orthopædic Dept. At rate of £125.

Sheffield Royal Hospital.—Ophth. H.S. Also Res. Anæsthetist. Each at rate of £80.

Sheffield Royal Infirmary.—Asst. Cas. O. At rate of £80.

Southport General Infirmary.—Sen. H.S. £200.

Stirling District Mental Hospital, Larbert.—Jun. Asst. M.O. £300.

Taunton and Somerset Hospital.—Hon. Visiting S. or Two Asst. Hon. Visiting S.'s

Truro, Royal Cornwall Infirmary.—H.S. £170.

Walsall County Borough.—Asst. M.O. £600.

West London Hospital, Hammersmith-road, W.—H.P., Two H.S.'s and Res. Anæsthetist. Each at rate of £100.

Westminster Hospital, Broad Sanctuary, S.W.—Orthopædic Surgeon.

Willesden U.D.C.—Asst. M.O. £600.

Windsor, King Edward VII. Hospital.—H.S. At rate of £ 00.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Dunoon (Argyle), and Sandbach (Ches.).

Applications from Ophthalmic Specialists are invited for the post of Medical Referee under the Workmen's Compensation Act to deal with cases arising in the districts of the following County Courts:—Dewsbury, Leeds, Otley, and Wakefield (Circuit No. 14), Pontefract, Tadcaster, and York (Circuit No. 15). Applications should reach the Private Secretary, Home Office, Whitehall, London, S.W., not later than March 3rd.

Births, Marriages, and Deaths.

BIRTHS.

MCCAY.—On Jan. 27th, at Headington, Oxford, the wife of Dr. C. A. R. McCay, of a daughter.

VINER.—On Jan. 29th, at Chorley Wood, Herts, to Mona (née de la Mare), the wife of Geoffrey Viner, M.D., F.R.C.S., of 4, Harley-street, W.1—a daughter.

MARRIAGES.

ALLOTT—KYDD.—On Jan. 29th, at St. Paul's Presbyterian Church, Birkenhead, Eric Newmarch Allott, B.M., M.R.C.P., to Edith Mary, younger daughter of Mrs. Kydd and the late William Kydd, of Birkenhead.

BATES—PYKE.—On Feb. 1st, at St. Mary Abbot's, Kensington, Ralph Bates, F.R.C.S. Eng., to Evelyn Pyke, M.R.C.S., L.R.C.P., younger daughter of the late Lionel Pyke, Q.C., and Mrs. Pyke.

PUGH—CULLWICK.—On Jan. 29th, at St. Peter's Church, Wolverhampton, Mervyn Phippen Pugh, D.S.O., M.C., to Vera Cullwick, M.B., Ch.B., youngest daughter of Mr. and Mrs. H. E. Cullwick, of Wolverhampton.

ROFF—DYSON.—On Jan. 28th, at St. James', Birch, by the Right Rev. the Lord Bishop of Middleton, Chas. D. Roff, son of Mr. and Mrs. C. D. A. Roff, of London, to Margaret Dyson, daughter of Dr. and Mrs. W. Dyson, of Rusholme. At home, Feb. 27th and 28th, Beechfield, Wilmslow.

DEATHS.

BURY.—On Feb. 3rd, 1930, at Hollinwood, Darwen, G. W. Bury, M.D. Vict., F.R.C.S. Edin., aged 44.

CLAPP.—On Jan. 27th, at his residence, Downside, Whitchurch, Tavistock, Devon, Robert Clapp, Physician and Surgeon, M.R.C.S. Eng., L.R.C.P. Lond.

DAVIS.—On Feb. 3rd, at Bournemouth, Charles Daniel Davis, M.R.C.S., L.D.S. Eng., of Merstham, Surrey, and late of Streatham Hill.

DRABBLE.—On Jan. 31st, at The Grange, Walton-on-Thames, George White Drabble, M.A., M.B., B.C., in his 66th year.

ELLIS.—On Jan. 29th, at a nursing home in London, of peritonitis, William McDonogh Ellis, M.D., M.R.C.S., L.R.C.P., of "Greenbanks," Woldingham, Surrey, and late of Bath, Somerset.

KEKWICK.—On Jan. 27th, at "Ellerslea," Dalston, Cumberland, John Kekwick, M.R.C.S., L.R.C.P., L.D.S.

MACARTNEY.—On Jan. 27th, at Brighton, of heart failure, James Macartney, M.D., Lieut.-Colonel, late R.A.M.C.

SCOTT.—On Jan. 28th, at Saskatoon, James Matthews Duncan Scott, M.D. Edin., D.P.H. Camb., Professor of Physiology in the University of Saskatchewan, Saskatoon.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE ANTI-NOISE CAMPAIGN IN NEW YORK.

EVERY civilised community is finding itself faced with the problem of noise and the devastating effect of continual and excessive auditory stimuli on the nerves of the people. New York has tried to reduce the problem to mathematical terms by inventing a unit of sound—the "bel." Broadcasting a description of the work on Dec. 31st, Dr. Harvey Fletcher produced the sound of a motor horn ten feet away as an example of "nine bels" of sound. The noise in various parts of New York is being measured by producing a clear warbling note that can just be heard above the traffic roar and then measuring the intensity of the note in a "noise meter." This is a sensitive microphone which converts the sound waves into electric currents, which in turn are amplified and passed into an electric meter. The quality, as well as the quantity, of city noises is being tested by means of noise filters. The investigators are finding out the part played by specific sources—e.g., trucks, trolleys, building operations—in producing the aggregate noise, and also the pitch, range, and loudness of specific noises which are the cause of complaint. When this information has been collected it will be possible to make constructive proposals for noise abatement. Other workers are concerning themselves with the production of sound-proof buildings and of a combined window-ventilator and sound-muffler that will admit air without admitting noise. Mr. R. V. Parsons, an acoustical engineer, in a broadcast talk on Dec. 27th, maintained that sound-proof construction is possible and practicable for offices, homes, and public buildings to-day. While it is the task of architects to introduce improvements in design and construction, much can be done by furnishing the rooms with heavy-pile rugs and hangings and over-stuffed divans and chairs. Books, he observed, are very sound-absorbent. The American economist is convinced that quiet is worth paying for; last year $3,000,000 were spent in quieting American offices. Dr. Donald Laird has found that noise appreciably diminishes the concentration, memory, and speed of employees. Our noise problem may not be as serious as that of New York, but it is certainly bad enough, and it is to be hoped that those who suffer from the effects of modern noise will join with those who are concerned about its effect on the public health and create that public demand which alone will produce the supply of noise-proof devices for our homes and work-rooms.

HEREDITY AND ENVIRONMENT.

IN an address on the relative importance of heredity and environment in the development of the individual, delivered in London under the auspices of the British Social Hygiene Council on Jan. 30th, Mr. C. C. Hentschel remarked that heredity was taken very much for granted. It was expected that like should beget like, and it was not until we considered what a queer world it would be if there were no heredity—with the possibility of a sheep, for instance, giving birth to calves or lizards instead of lambs—that its real meaning became apparent. From the strict biological point of view, the changing of the environment did not seem to be likely to produce any immediate effect upon heritable traits. The question of the inheritance of acquired characters was still one of the vexed controversies of biology, which must be left to the future for solution; and there was little evidence at present to show that the environment could—except perhaps over a long series of generations—produce any marked effect on racial characters. What the environment was able to do was to produce from the organism those characteristics which it had received as its inheritance, and to give them the fullest opportunity for coming to fruition. It was a waste to sow good seed on a barren soil, just as it was a crime to use rich soil for worthless seed. Only if the rich soil was reserved for the good seed could we hope for some permanent racial benefit.

An abstract of Mr. Hentschel's previous lecture on Biology and the Training of Youth appeared on p. 256 of our last issue.

BREADMAKING.

THE aim of a book on breadmaking by Mr. E. B. Bennion[1] is to show that a *proper application of the fundamental* principles of physics, chemistry, and biochemistry is essential to the practical art of breadmaking. Many chapters of the book are devoted to such problems arising in the bakehouse as the choice and testing of raw materials; the changes involved in fermentation, baking and cooling, and the effect of varying physical and chemical environments on these changes; the advantages and disadvantages of the straight-dough and the sponge-and-dough processes; recipes; the judging qualities and faults in bread; and the diseases which may arise in flour, yeast, and bread. Other chapters deal with the comparative efficiency of different types of fuels, ovens, and machinery used in the bakehouse, and the final chapter is concerned with the dietetic value of bread compared with other foods.

WAITING-ROOM LITERATURE.

MUCH admirable volunteer work is being done in the Rhondda Valley in behalf of young boys and youths the victims of unemployment, and an appeal is being made to medical men to come to the assistance of this work in a useful direction. In many medical waiting-rooms there is a large and varied assortment, up to date or otherwise, of illustrated papers and magazines, and it is suggested that the doctors might be willing to send the old issues of this literature as newer ones appear to a collecting centre in the Rhondda for distribution to these lads. The Editor of THE LANCET will be happy to receive the names of those who are willing to coöperate, when an arrangement will be made by which stamped and addressed wrappers for a certain period ahead will be supplied to them. The particular boys for whose sake this suggestion is being made are received regularly in a hut-shelter for instruction and entertainment, and the eagerness has been noticed with which they seek all sorts of general and special instruction. The doings of smart society at home and abroad and at social or sporting functions would have no interest for this audience, but they are hungry for newspapers, magazines, or manuals in which the phenomena of the world and the serious sides of life, its careers and occupations, are recorded. All literature dealing with natural history or providing technical training, as far as the printed word can do this, will be devoured. The gratitude which those who can help in this way will earn can hardly be exaggerated.

"WHERE TO PARK YOUR CAR."

A COMPLETE handbook of parking-places in every part of the United Kingdom and the Irish Free State is issued under this title by the Roadway Time Tables Bookings and Publications, Ltd., Regency House, London, W.1, at 1s. The book has been brought up to date, and in its fourth edition, of nearly 300 pages, gives information about the charge and attendance, if any, the limit of time during which cars may be parked, and the places where automatic traffic signals are in use. The convenience to tourists of knowing in advance where to make for when visiting a strange town is considerable; once the car is safely stowed away a survey can be made of the most acceptable sources of interest or refreshment without fear of infringing local regulations. Travellers from London will be cheered to note in how many provincial towns no time limit is fixed for cars in parking-places. The parking-places within 15 miles of Charing Cross are not very conveniently arranged in the book. It is difficult to see on what basis the districts are classified; the list starts with Westminster and ends with Erith. An index shows the name of the roads in alphabetical order; for example, Adelaide-road, Southall, heads the column, but the other Southall parking-place is indexed under Lady Margaret-road, Southall, and if the reader starts with a wish to find the parking-places in Southall he must either search this index with some care or find Southall (between Kingston and Slough) in Section IV. of the book. The remedy would be to rearrange this section in alphabetical order.

GAS FIRES AND THEIR SETTINGS.

A LITTLE book[1] by the late Sir Lawrence Weaver deals with the artistic or æsthetic rather than with the practical use of gas heating. His efforts will, we hope, influence architects to work out methods of treatment for this efficient heating agency. Cumbersome and ugly chimney-pieces often spoil otherwise pleasant rooms, and are unnecessary when these are heated by gas. Anyone building a new house or rearranging fireplaces will welcome this book; special attention should be paid to Figs. 26, 27, and 28, showing gas fireplaces installed by Sir Giles Scott in his own house. On the more practical side of gas heating we would commend to the ingenuity of gas engineers for solution the problem of the man recently portrayed in *Punch* who desired a lamplighter's long tube in order to light his bedroom gas fire without getting out of bed. This would be a great convenience to invalids.

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[1] Breadmaking: Its Principles and Practice. By Edmund B. Bennion, M.Sc. Tech. Vict., A.I.C., Head of the National Bakery School, Borough Polytechnic, London. London: Humphrey Milford, Oxford University Press. 1929. Pp. 251. 15s.

[1] Gas Fires and their Settings. By Sir Lawrence Weaver, K.B.E., F.S.A. London: The Fanfare Press. 1929. Pp. 64. 7s. 6d.

Hunterian Lecture

ON

MASSIVE COLLAPSE OF THE LUNG.

Delivered before the Royal College of Surgeons on Feb. 7th, 1930,

BY SIR JOHN ROSE BRADFORD, K.C.M.G.,
M.D. LOND., F.R.S.,

PRESIDENT OF THE ROYAL COLLEGE OF PHYSICIANS OF LONDON; CONSULTING PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL AND THE SEAMEN'S HOSPITAL.

MR. PRESIDENT, FELLOWS OF THE COLLEGE OF SURGEONS AND GENTLEMEN,—I find it somewhat difficult, Sir, first of all to express in an adequate manner my thanks to you and to the College for giving me the opportunity of speaking to you here this afternoon. I think I am correct in saying that this is the first time on which the occupant of the office I have the honour to hold at the moment has had the opportunity of speaking in this theatre. I am quite sure the College of Physicians has the same views as myself with regard to this, and looks upon it as a most happy innovation; and I only hope that my own College may be able in the future to return the compliment and to ask one of the Fellows of this College to address them. Although I greatly appreciate the compliment that has been paid to my College, this increases the difficulty I am labouring under in addressing you to-day, because, obviously, the occasion is one which ought to be made full use of, and I ought to have something of interest, if possible, to bring before you. I am afraid that by the time one reaches the period of life that I have arrived at, it is difficult to contribute anything really to the advance of knowledge; one has to look to the younger men to do that. I am well aware, if I may say so, of the difference of the circumstances under which I am speaking in this theatre now and the occasion on which I had the pleasure of speaking in it very nearly forty years ago. Perhaps I ought not to have alluded to this, but I really could not help alluding to it; it is a fact that the first lecture I gave to a medical audience was given in this College, and I suppose this is the last lecture I shall give to a medical audience; and I am grateful to you, Sir, and to the College, for that notwithstanding that I feel I have nothing very suitable to bring before you. I beg to thank you very sincerely.

In seeking for a subject on which a physician could address a gathering of surgeons, I thought I would try to find something which would appeal to both branches of our profession; and that was my main reason for selecting the subject "Massive Collapse of the Lung." I am afraid I have nothing very new to say on the subject, but it is one that has always struck me as singularly interesting, because of the mystery attached to it. It has always seemed to me a phenomenon which, on the surface, would appear to have a very simple and purely mechanical explanation and yet probably that is not so, there is probably a more complex mechanism at work. Further, it is a subject, at any rate, on which knowledge is not very widely disseminated. It is a condition that is very often overlooked, and it is a condition which is always obscure and difficult to interpret.

It is not quite fifty years ago since it was first described, and, as you probably all know, the two names which stand out conspicuously in the history of the subject are those of Pearson Irvine in the first place, and Pasteur in the second place.

INCIDENCE.—FREQUENCY.

First with reference to its incidence. Massive collapse of the lung is seen, of course, in civil practice, and was seen in a large number of instances in military medicine and surgery. A great deal of our knowledge of the subject has been derived from the observations which were made, under exceptionally favourable conditions, in the late war; the conditions under which it occurred there were often somewhat more simple than those in which it is seen in civil practice. In civil practice, speaking broadly, massive collapse is seen as a complication of some underlying, and usually more or less grave, condition. In military practice, on the other hand, although, no doubt, it is often seen similarly as a complication in grave cases of various injuries, it is also seen in conditions which may be described as comparatively trivial, some of them, indeed, quite trivial. Hence the problem of its nature and the various facts in connexion with it are more easily elucidated than they are in civil practice.

As regards its frequency, one has great difficulty in making any statement that is of value, owing to the large number of instances in which it is overlooked. Those who are interested in the presence of massive collapse and are familiar with its more or less characteristic physical signs will find it in a very considerable proportion of cases; on the other hand, some of the most extreme cases of the condition may be entirely overlooked by those who are not familiar with its clinical picture. Therefore it is very difficult to make any statement with reference to its frequency. The reasons for that, apart from the one I have mentioned, are, that it frequently occurs as a complication, and consequently its presence is overlooked owing to the attention being concentrated on the underlying condition. Furthermore, it is overlooked for another reason—namely, that it is liable itself to be followed by inflammatory complications, and then, unless it has been previously recognised, it is, almost necessarily, not recognised. There are many reasons, therefore, as far as my experience goes, for thinking that no very accurate statement can be made with reference to its frequency.

ÆTIOLOGY.

Now as to its ætiology. Its ætiology is certainly very complex, and that suggests that there are probably many varieties, or at any rate several varieties, of massive collapse. It is difficult to believe that there can be simply one cause for it when, as you will see in a few minutes, the factors in its production are so various. Originally, cases which were described by Pearson Irvine were cases in which the condition was dependent on palsy of some kind. Originally it was described, as probably you know, in cases of diphtheritic paralysis. Another large group of cases, particularly those which Pasteur treated of, were those in which many factors came into play, as—for example, anæsthetics, operations, posture, &c. They were cases seen in operations of varying degrees of severity, especially operations in the abdominal region—hernias, appendicitis, and various other conditions. Some have thought that the condition was especially associated with operative procedures in the upper portion of the abdomen. But, of course, it is clear that where you have such conditions as palsy, such conditions as the use of anæsthetics and operative interference, all kinds of questions arise and it is difficult to trace the chain of events.

To consider further the question of ætiology, in many of the cases you not only had more or less severe operative procedures, but there were also severe underlying diseases present, possibly even peritonitis. In many others there were very severe injuries: fractures of pelvis or thigh, conditions which necessitated immobilisation of the patient. It may be said, broadly, that in civil practice, therefore, the conditions leading to the subsequent development of massive collapse were singularly complex.

Now, in military practice, as a result of gunshot wounds, especially of the chest, no doubt [illegible] cases the conditions here also were

Any physician or surgeon who had experience of chest wounds in the late war would recognise at once the extraordinary variety of the lesions produced, and the complexity of the lesions and the complexity of what the physician talks of as physical signs. But there were other cases in military practice of chest wounds where the conditions were by no means very complex.

The chest wounds are divided conveniently into the (*a*) penetrating, and (*b*) the non-penetrating, and in any discussion as to the nature of massive collapse one is inclined to lay more stress on the simpler non-penetrating lesions of the chest than on the penetrating lesions; but even in a non-penetrating wound of the chest conditions may be very complex. For example, every one familiar with wounds of the chest knew that in non-penetrating wounds such a phenomenon as hæmoptysis was of common occurrence, and if you have such a phenomenon as hæmoptysis the problem of the ætiology of massive collapse is immediately rendered exceedingly difficult. Hæmoptysis might conceivably be a factor even in such a remarkable variety of massive collapse as that described as "contralateral," because with a non-penetrating wound of the chest producing hæmoptysis it is obvious that blood might be drawn down into the opposite lung. So in any discussion as regards the mode of production of massive collapse I would suggest that in military practice not only must one eliminate the consideration of cases of penetrating wounds of the chest—because there the conditions are too complex—but one must also eliminate cases of non-penetrating wounds of the chest where such a phenomenon as hæmoptysis has been present. If you eliminate those groups the number of cases which is left is relatively small, but they are singularly instructive, as we shall see in a moment.

There are a considerable number of cases of chest wounds limited to the parietes of the chest where there is no reason to think that any appreciable injury has been inflicted on the lung on that side, and it is more especially with reference to that type of case that I propose to ask your attention.

I suggest, then, that first of all in massive collapse in discussing the ætiology of it one has to consider several varieties; that in some of these one may have to deal with questions of definite palsy of the respiratory muscles, in others one may have to deal with questions of bronchial obstruction. But, in addition, there is a certain definite group of cases in which these phenomena, humanly speaking, can be eliminated, and where one has to invoke some other mechanism. The consideration of the facts in that last group of cases necessarily raises the question or the suggestion as to whether a similar line of argument may not be applied to the first two groups, and suggests that if the third variety cannot possibly arise either as a result of obvious palsy or as a result of obstruction of the bronchial passages, it may well be that in the cases where the condition arises apparently as a result of these, this is not really the case.

PHYSICAL SIGNS.

Now to pass on to say a few words with reference to the physical signs of massive collapse. If there is one lesson which was impressed on a physician more firmly than any other in the course of his medical practice in the late war, where he had unrivalled opportunities of studying physical signs, it was the necessity of revising some of our cherished convictions as regards the interpretation of physical signs, and I do not think there is any lung condition which plays a greater part in that than a study of the physical signs of massive collapse, because they are very remarkable.

They are, apparently, very elementary and very simple, but the more one studies them the more one doubts their being as simple as they seem to be. The first thing which strikes one as regards the physical signs of cases of massive collapse is the immobility of the chest on the affected side. That seems a trite statement. We have been taught that the chest is immovable in pleural effusions, and so on; but the immobility of the chest in a case of pleural effusion is quite a different immobility to that of the chest which is seen in massive collapse; one is a relative immobility, the other is an absolute immobility. I know of no condition, as regards physical signs in the chest, in which absolute immobility is so marked and characteristic as it is in massive collapse. You may think, gentlemen, that one lays too much stress on these comparatively simple things, but that is not my view.

It is convenient to describe the physical signs of massive collapse as running through three stages: in the early stage, when you have this very marked immobility, you have, also, weakness—or even absolute extinction—of the breath sounds. Now, weakness of breath sounds is, apparently, a very trivial observation from the physical sign point of view, one that often is very little stressed. It is described as one due to many different causes. Absence or diminution of breath sounds in massive collapse is a phenomenon much more marked than in the more usual conditions which we associate with that physical sign. In the early stages of massive collapse these are leading physical signs. But the most important physical sign, the one that probably, in the vast majority of cases, leads to the immediate recognition of the condition by those experienced in it, is the extraordinary displacement of organs which takes place, particularly of the heart and of the abdominal viscera, owing to the displacement upwards of the diaphragm. There have been remarkable mistakes made as a result of overlooking this condition. In my experience in France I saw many cases in which pneumothorax was diagnosed, and yet the real condition was that the left side of the diaphragm had been displaced so high that the tympanitic resonance of the stomach was reaching the third or fourth rib, and so was mistaken for pneumothorax, sometimes with unpleasant results. To give you an idea of the extraordinary extent of the displacement: the heart way be displaced to a degree to suggest congenital transposition of viscera. I have myself made the mistake in a case of massive collapse of the lung of thinking that there was no massive collapse present, and that it was a case of congenital transposition of the viscera. That will give you an idea of the extreme displacement which may take place, without necessarily the development of any symptoms at all.

So one would lay stress on the great immobility of the chest wall on the affected side, on the extraordinary degree of displacement of the contents of the thorax, such as the heart, and the extreme displacement of the abdominal viscera owing to the high position of the diaphragm.

In the second stage of the condition, weakness of breath sounds becomes replaced by what is described as tubular breathing; and it is the most perfect tubular breathing that one is acquainted with. It may reach a degree of development even greater than that which we are familiar with in lobar pneumonia; it may reach a degree which justifies, almost, the term "cavernous." And inasmuch as the area of massive collapse may often be a very large one, I need not say that physical signs of that description over a very large area, without the patient, perhaps, presenting very marked symptoms, leads to extraordinary confusion sometimes in the mind of the observer, because he has been so convinced in his training that breathing of that character must mean pneumonic consolidation, that he fails to recognise the tubular breathing of massive collapse that may be even more marked than in pneumonic consolidation.

In the later stage of the condition you have the development of a number of moist sounds, abundant râles and crepitations, or, to put them in their proper order, crepitations and râles, with the result, again, of producing a clinical picture extraordinarily similar to that of pneumonia.

The symptoms of the condition are not very characteristic, and they are extremely variable. There may be a degree of massive collapse not, perhaps, so great as that seen in this specimen before you, but not far short of that, and yet without the presence of any obvious symptoms at all, at any rate when the patient is in bed. But, as I have recorded elsewhere, I have known the case of a man who was hit in the lower part of the chest, at the back, by a bullet, which produced such a superficial wound that it dropped on the floor when he took off his clothes, and he had walked four miles after he had been hit. He was admitted into hospital on the evening of the day he was hit, and he had no appreciable discomfort of any kind, yet he had collapse of the whole of one lung, on the side opposite to that wounded, symptoms may thus be entirely absent. In other cases dyspnœa, of varying degrees of urgency, may be present, and in the later stages of the condition, more especially when those fine râles and crepitations which I alluded to before are present, the patient may have some cough and some expectoration. The essential clinical fact is that you may have a very large area of one lung thrown out of gear and made useless from the respiratory point of view, without the development of any serious symptoms to attract attention.

SITUATION.

As regards the situation of a massive collapse it is most commonly present in the basal portions of the lung. Perhaps the seat of election is the upper part of the middle third of the lower lobe, but it may involve the whole of one lung. I have not been absolutely satisfied, from my own observation, of massive collapse involving the apex only. Of course, you have the apex involved when the whole lung is implicated, but I do not dogmatise about it, because it is a difficult observation to make. In some cases the condition is bilateral, and here again it is often difficult to recognise, because if there is weak breathing at both bases you have lost your standard, and it is very difficult to be absolutely certain of the diagnosis short of X ray examination, and that has not always been possible.

COURSE.

As to the course of the condition, one of the striking features of it is the rapidity with which the physical signs change. I mentioned a moment ago—and I revert to it because I think it is a very instructive case—where an error of diagnosis was made through looking upon the case as one of congenital displacement of the heart. It was the case of a man with a trivial wound of the clavicle on one side, and he had massive collapse of such a degree as to cause the heart to be beating just internal to the right nipple, so there was extreme collapse of the right lung. I was taken to see that case—as it was known I was interested in massive collapse and it was thought it might be an instance. The complete absence of any symptoms led me to think there was no massive collapse, and that it was an instance of transposition. In that case the heart went back to the other side in 30 hours. That gives you an indication of the rapidity with which the physical signs may change, even in the most extensive massive collapse.

Inflammatory complications may occur. The case may begin as one of massive collapse, and then it may become complicated by pleurisy, and even by the pouring out of fluid. Or it may be complicated by broncho-pneumonia, by confluent lobular pneumonia; and then, unless you have seen the case from the beginning a diagnosis would be impossible, because then the case resembles ordinary pleural effusion or broncho-pneumonia.

DIAGNOSIS.

With reference to diagnosis, I have perhaps said enough already to point out that the diagnosis is often difficult, and it may be especially so in some cases of what is spoken of as contralateral massive collapse, understanding by that term cases in which massive collapse occurs on one side of the chest after an injury to the other side, and sometimes a comparatively trivial injury. The diagnosis is generally arrived at by considering the physical signs which I have mentioned—namely, the extreme immobility, the extreme displacement, together with the absence of marked symptoms. But extraordinary errors are liable to be made, some of which I have already mentioned, as, for example, imagining that the mischief is on the opposite side of the chest to that on which it really is, and the diagnosis of pneumothorax as a result of mistaking the gastric resonance for air in the pleural cavity.

THE NATURE OF MASSIVE COLLAPSE.

To pass, now, to the more interesting question as to the nature and mode of production of massive collapse. In discussing that, we have to consider the relation of the chest wall to the underlying lung. Now, Mr. President and gentlemen, the relation of the chest wall to the underlying lung is, I think, more complex than many of us in our everyday work think; we are rather overpressed with the idea of the relation being an entirely mechanical one. Of course, there is a mechanical relationship between the volume of the lung and the volume of the chest. Any of you who have examined a young child with reference to whether any pulmonary lesion is present knows that if a child with a soft chest is placed face downwards on the nurse's knee, that unless the nurse holds the child perfectly straight—that is to say, if the spinal column is a little curved, thus hampering the movements of the chest, this hampering, slight as it is, will, in the child, produce a perfectly definite area of dullness, which can be marked out by percussion, and produces weak breath sounds. And when the chest is straightened again and the child takes a deep breath, crepitations, &c., may be heard. Many a young student makes an erroneous diagnosis of the presence of pneumonia because he has not taken precautions to see that the two sides of the chest are symmetrically disposed when it is examined in this way. That is a very striking instance of the extreme case with which limitation of the movements of the chest will immediately produce effects in the underlying lung.

So I do not think anything more need be said with reference to the anatomy and close mechanical relations existing between the volume of the lung and the size of the chest. But, above that, there is a vital, a living relationship between the two. There are experiments—of many years ago now and often forgotten—of Hering and Breuer, subsequently extended by Head in this country, showing the most extraordinarily delicate relationship between the volume of the lung and the tonus of the chest wall. Those who have seen these experiments will agree that there is an extraordinarily complex relationship between the volume of the lung and the tonus of the musculature of the chest. The slightest diminution of the volume of the lung by sucking a small quantity of air out of the trachea produces, reflexly and *immediately*, *an increase in the tonic contraction* of the diaphragm and of the inspiratory muscles, with the result of neutralising the sucking of the air out, and causing the intake of a larger volume. It is one of the most delicate reflexes known to the physiologist, and it is a most beautiful example of a pressure stimulus. A diminution, by a few millimetres, of the pressure of air in the bronchial tree immediately produces a reflex, leading to an increased tonic contraction of the diaphragm and other inspiratory muscles. Conversely, the raising of the pressure produced by a very slight puff, barely audible, will produce an immediate expiratory tonus. So that, apart from the mechanical relationship existing between the volume of the lung and the volume of the chest, there is a very delicate complicated reflex nervous mechanism between the two, and this must be borne in mind.

MECHANISM OF PRODUCTION.

Now a few words with reference to the mechanism of the production of massive collapse. It would seem that if it is true—as it unquestionably is—that a very slight lesion incapable of producing severe symptoms on one side of the chest may, in the course of a few hours only, lead to extreme collapse of the opposite lung, it is difficult to see that this can be due to any other cause than a reflex mechanism of some kind. You cannot invoke bronchial obstruction to explain such a condition as that, and it is difficult to see how you can invoke any palsy. There must be some reflex mechanism. If there be a reflex mechanism of that kind, is it that the lung first of all becomes collapsed and then the chest wall, following it, becomes immobile? Or is it that the chest wall becomes immobile and, as a result of that, the lung collapses? We know that if you impede the respiratory movements, or if you obstruct the bronchial tree, the rate of absorption of the air of the lung is extremely rapid. So there is no particular difficulty in understanding that collapse of the lung should be brought about if, by some mechanism, immobility of the chest wall is brought about. On the other hand, it is difficult to believe that there can be, as the result of an injury of the chest wall, any activation of a reflex mechanism which acts directly on the lung. I know it has been suggested that possibly the involuntary muscular tissue in the lung may lead to its contraction. It has also been suggested that there may be reflex effects on the vessels of the lung. It would take too long to discuss these points, but they are not very plausible hypotheses. On the other hand, though one cannot say what the nature of the reflex mechanism is, yet it is not incredible that there may be a reflex mechanism which may lead to immobility of the chest wall. At any rate it is very difficult to believe that the phenomena can be due to any primary obstruction of the bronchial tree, either by spasm, or by blood, or by secretions, or what not. Blood and secretions, &c., are rather excluded, *ab initio*, by limiting our consideration to the cases of contralateral massive collapse following trivial injuries of the chest wall. Further, I think the main reason one is sceptical as to any primary mechanism of bronchial obstruction is that surely all varieties of bronchial obstruction which we know produce symptoms, and it is very difficult for me to see that you could have such a degree of bronchial obstruction brought about as to lead to collapse of the whole of one lung and yet the patient have no symptoms of distress of any kind. Therefore I incline rather more to the view that there must be a reflex mechanism of some kind which acts primarily on the wall of the thoracic chamber, both on the diaphragm and on the intercostal muscles, and in that way brings about the immobility of the chest; and, as a result of this, the air in the lungs is absorbed and massive collapse ensues.

CONCLUSION.

Mr. President and Fellows of the College, those are the main considerations which I wished to put before you. I am quite aware of the fact that it is by no means a satisfactory or complete, or even a partial, explanation of the phenomena of massive collapse; at the same time, I think that the study of this condition, particularly when it occurs in association with simple injuries, is of great interest, and one in which we are dealing, perhaps, as I hinted earlier in my remarks, with a condition where there is really at work some mechanism more complicated than a mere mechanical relationship between the contents of the thorax and the parietes. Of course, a superficial comparison which must occur to anybody who thinks about the condition is, that it presents some resemblances to the rigidity of the abdominal wall which we are familiar with in abdominal diseases. Whether it is more than a superficial resemblance I do not know, but at any rate I suggest that those who have the opportunities of observing the occurrence of this condition—and surgeons are more likely to have these opportunities than physicians—will be able in the near future to throw more light on the nature of its causation.

An Address
ON
SOME MODERN ASPECTS OF
CHOLECYSTITIS AND CHOLELITHIASIS.

Delivered before the Manchester Surgical Society on Feb. 4th

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INCREASING knowledge of the pathology of the gall-bladder is making it evident that disease of this organ is one of the commonest causes of dyspepsia and ill-health. In my own series there have been 574 cases. Although the total number of peptic ulcers in the same time-period has been 1277, the number of gall-bladder lesions has been greater than the ulcers of any one group—namely, 401 duodenal, 389 lesser curve, and 188 pyloric ulcers. It must be realised also that the greater number of these cases of gall-bladder disease were grosser examples which were associated with gall-stones, for it is only within recent years that it has been widely appreciated that cholecystitis may be present and may cause a considerable impairment of the general health without having as yet led to the formation of calculi.

My own figures support the well-known views that the disease is much more commonly found in women, there being 451, or 78·5 per cent., females. Especially common is it in extremely fat women. Although these are two of the earliest known points in our knowledge of the disease, so that the formation of gall-stones has long been regarded as a just retribution for a life of greed, yet we are far from understanding why calculi should be so much more common in women, and in women of this type. Indeed, with the increase of our knowledge the understanding of these facts has become more difficult.

FORMATION OF CALCULI.

In the investigation of the cause of cholecystitis and calculi formation one fact is outstanding, and that is that the majority of calculi are largely formed of cholesterol. Although this substance is normally present in the bile, is apparently present in larger quantities in women, and is greatly increased both in the blood and bile during pregnancy and some diseases, it appears to be quite certain that it is only found in those stones which are formed in the gall-bladder. In some cases it may be pure, giving rise to a relatively small solitary calculus which is formed of amorphous cholesterol or is slightly tinted with bile-pigment; in other cases a certain percentage of calcium carbonate and pigment may be present. It would thus seem natural to believe that this cholesterol had been simply deposited from the bile owing to the concentrating effect of the gall-bladder action, especially if the cholesterol-content of the bile is above normal. There are, however, as will be shown presently, many reasons against the acceptance of this view.

The other main group of calculi are those formed of pure pigment calcium. They are much less common, only 45 of my series being of this type, and appear to be generally formed in the ducts. If calculi are found at birth or in very young children, or are primarily deposited in the intrahepatic ducts, they are always of pure pigment calcium and may be formed in the absence of any inflammatory change. They are also found in a very large proportion of cases of acholuric jaundice, when they may be deposited in the gall-bladder or in the bile-ducts, and if removed from the gall-bladder, or even if a cholecystectomy be performed, they will almost certainly recur in the ducts unless the spleen has been removed. It thus seems certain that this particular variety of calculus may be formed owing to a metabolic error. Like the other varieties of calculi, they may also, however, be deposited owing to inflammatory changes; thus true recurrent calculi in the common bile-duct occurring after cholecystectomy and due to the presence of cholangitis are formed of pigment calcium alone.

In my opinion the other varieties of calculi always owe their inception to the presence of chronic inflammatory changes, and the evidence that has often been adduced that there is here also a metabolic change does not appear to be sufficient. They occur much more commonly in middle age. In my own group 320 occurred between the ages of 40 and 60. In every case in which calculi other than those of the pure pigment type have been removed, there has always been evidence of a chronic inflammatory change in the gall-bladder. The suggestion that this change is secondary to the gall-stones and is not their cause would not appear to be correct, for it is relatively common to find inflammatory changes in the gall-bladder with no calculi, but calculi without inflammatory changes are never seen. The recent work of Illingworth and Wilkie, showing that the infection is in the substance of the gall-bladder wall and not in the mucous membrane, strongly supports the view that the inflammation is the primary change. The careful examination of any calculus will show that usually its whole structure and always its outer layers are deposited in an amorphous form and never occur as crystals. If crystals are present they are found only in the centre of the calculus and are probably due to a secondary change. If the constituents of the calculus had been simply deposited from a super-saturated solution, they would certainly have come down in a crystalline form. The amorphous deposits occur, however, always in association with an organic matrix, and are therefore almost certainly deposited by a process of adsorption. Thus it is that a biliary calculus cannot be made to dissolve in a solvent of cholesterol or bile-pigment.

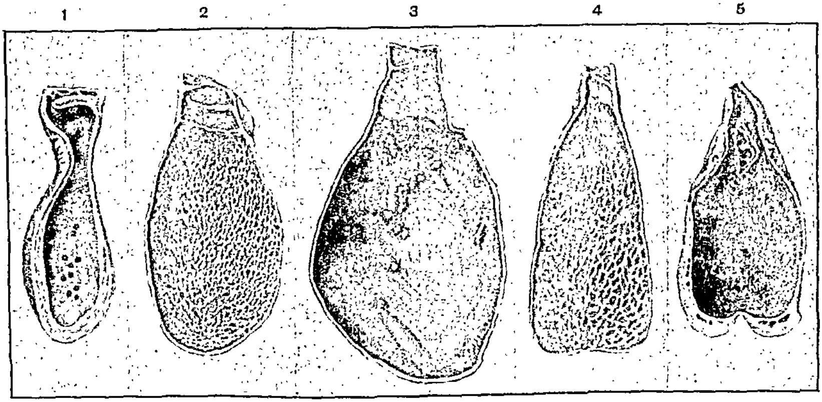

FIG. 1.—Typhoid cholecystitis showing gross changes in the bladder wall and only a few small calculi.
FIG. 2.—Strawberry gall-bladder as removed at operation. It contained one small stone.
FIG. 3.—Lipoid deposits forming papillary masses in the gall-bladder. There were no stones.
FIG. 4.—Strawberry gall-bladder found post mortem in a patient who died of eclampsia. There were no stones.
FIG. 5.—Intramural calculi. Several stones are seen in cystic spaces in the wall of the gall-bladder. There were none in the lumen.

In a large number of the cases the clinical history dates back to an infection. In the past this was commonly typhoid fever, but now that this disease is becoming a rarity it is not uncommon to find a past history of influenza, pneumonia, or some other infection from which the gall-bladder symptoms date. It is well known that in cases of typhoid fever acute cholecystitis may occur during the course of the active disease, and under such conditions gall-stones are not found. It is only of recent years that it is becoming appreciated that symptoms of mild cholecystitis may occur with many forms of general infection, that dyspeptic symptoms may be initiated at this time, and that it is only later that evidence of gall-bladder disease dominates the clinical picture. In some of these infections a very gross and marked change may be found in the gall-bladder wall, while gall-stones are very small or absent. An interesting example of such is the specific typhoid cholecystitis which is shown in Fig. 1. The patient had had typhoid fever two years before and had become a typhoid carrier, typhoid bacilli being present in the stools. The gall-bladder shows a very great thickening of its wall, but only a few small stones. After removal of the gall-bladder the patient ceased to be a carrier, the typhoid bacilli disappearing from the stools. It seems almost certain that in cases of this sort the cholecystitis is the primary change and that the gall-stone formation is a secondary effect.

It is in the formation of pure cholesterol calculi especially that claims have been put forward that the stones are primary and are not due to a past infection. The work of Aschoff and Bacmeinster is well known in this connexion, but here again it is difficult to accept their views, for such calculi always occur as a single stone in a dilated gall-bladder and are never formed in the ducts, and it is difficult to see why this should be the case if they originated as a simple deposition of cholesterol. My own experience with this variety is very definite. There have, in my series, been 23 examples, every one of which showed inflammatory changes in the gall-bladder, eight being associated with acute cholecystitis and 15 with chronic.

That curious condition known as the "strawberry gall-bladder" is perhaps not quite so definite. There is here a lipoid deposit which Boyd has shown to be an ester of cholesterol (Fig. 2). It is most commonly seen as streaks which are deposited in the apices of the swollen folds of mucosa. It may actually occur in the epithelial cells or in the delicate areolar tissue beneath. These streaks are usually distributed over the whole of the gall-bladder lining, but end abruptly at the commencement of the cystic duct. In some cases, however, it is aggregated in localised masses so as to form small yellowish-white papillomata (Fig. 3), which are most commonly situated in the fundus of the bladder. This method of deposition and limitation to the gall-bladder itself would suggest at first sight that the deposit was due to a metabolic change. The well-marked specimen illustrated in Fig. 4, which was obtained from a patient who died from eclampsia in pregnancy, would seem to support this view. Illingworth has shown, however, that the condition usually occurs in association with a mild cholecystitis, although at times it appears to be primary. In 17 of his 35 cases gall-stones were present. He also made the interesting observation that it could not be produced experimentally by increasing the blood cholesterol, but could be obtained by simultaneously increasing the cholesterol and infecting the gall-bladder wall. Baumgartner found that the condition was relatively common, it being present in 23 per cent. of all lesions of the gall-bladder, and stones being present in 50 per cent. of the cases. It seems probable, therefore, that even in this condition the primary change is inflammatory.

Interesting cases are occasionally seen in which stones appear to be present in the wall of the gall-bladder, but it is probable that these are not developed in the submucosa but in small hernial protrusions of the mucosa which have been shut off. The specimen seen in Fig. 5 shows several cystic-like spaces at the fundus which appear to be of this nature.

One of the strongest arguments that has been brought forward in support of the metabolic theory is the fact that some 75–80 per cent. of all cases of gall-stones occur in women who have had children, and, as it is known that the blood cholesterol is increased during pregnancy, it has been assumed that this change might account for the deposition of the stones. As in so many general observations of this sort, no attempt has been made to obtain controlled observations, and before we arrive at this conclusion we must know definitely what is the proportion of women between the ages of 40 and 60 who have had children. It is very probable indeed that in the general population at least 75 per cent. of women of this age are the mothers of children.

PATHS OF INFECTION.

Even if the above evidence be accepted that all calculi other than a few of the pure pigment calcium type are due to an infection of the gall-bladder, one can only hope in the future to prevent such changes if one has a complete understanding of the method by which such an infection reaches the bladder. The difficulties in obtaining such knowledge are increased by the fact that there are so many possible paths. These may be considered as follows: (1) up the common and cystic ducts; (2) along the portal vein, through the liver and into the bile, and so along the ducts to the gall-bladder; (3) by means of the systemic circulation; and (4) by direct or lymphatic spread from the liver, or some other organ such as the appendix.

It is natural to suppose that where there is an open path from the gall-bladder to the duodenum which normally contains organisms the easiest path of infection would be up this duct. This view was supported by the early observations that infections of the gall-bladder were most commonly due to *Bacillus typhosus* or *B. coli.* Hurst's observation that the achylia which is not infrequently found with gall-stones is dependent upon gastritis and may lead to an increase in the number of organisms in the duodenum is evidence in support of this view. It is, however, remarkable that increasing knowledge seems to show that what might be regarded as the natural paths of infection are, as a rule, so well protected that they are but rarely used. It is being realised, for instance, that infection of the kidney hardly ever takes place up the lumen of the ureter, nor do infections of the stomach usually arise from the ingestion of infected food. In the same way there is a considerable amount of evidence that ascending infections of the gall-bladder are rare. It is known, for instance, that the duodenum contains fewer organisms than any other portion of the intestinal tract, also a cholangitis even of a mild degree is a rare complication of gall-stones, and is practically only found as a sequence to, and not as a precursor of, gross disease of the gall-bladder. It has been frequently found also that in cases of chronic cholecystitis organisms could not be obtained from the bile, although in many cases they were found in the centre of gall-stones. Illingworth and Wilkie's observation that organisms are more common in the wall of the gall-bladder is also a strong argument against the possibility of this path of infection. The interesting fact has also long been known that whereas with typhoid fever it is very frequent to find *B. typhosus* in the bile, a cholecystitis is relatively rare, thus seeming to show that an infected bile is unlikely to lead to any change in the gall-bladder by direct passage.

Although the belief that the organisms were excreted by the liver into the bile, and thus infected the gall-bladder, was fascinating in that it was known that the liver had an inhibitory action upon organisms, and thus a chronic infection of the gall-bladder—which alone can give rise to gall-stones—would be more likely to be caused, yet many of the above observations seem to prove that infection from the bile itself is unlikely even by this path; moreover, such a means of infection would in no way explain the usual absence of cholangitis.

To-day, therefore, the general opinion is that the infection of the gall-bladder itself occurs either as a systemic infection or by direct or lymphatic spread from the gall-bladder or appendix. I have never been satisfied that sufficient evidence has been brought forward of a really close relationship between appendicitis and cholecystitis. That the two conditions can occur together is undoubted, but in my experience this has been relatively rare—that is to say, by no means as frequent as is commonly stated. In many cases of an operation upon the gall-bladder the appendix has been found to show some fibrosis or a few adhesions; which fact has been accepted—in my opinion unjustifiably—as evidence of a past appendicitis. That the primary infection is in the gall-bladder wall can, I think, be accepted to-day as true in the vast majority of cases. The experimental work of Illingworth and Wilkie showing that the bile inhibits the growth of organisms, that in cases of cholecystitis it is often sterile, that organisms—usually streptococci—are found in the substance of the gall-bladder wall and that these organisms when injected into the lumen of the gall-bladder produce no change, whereas when they are injected into the substance of the wall they generally produce a cholecystitis, appear to make this quite definite. Graham has shown that in most cases of cholecystitis there is an adjacent hepatitis suggesting that the primary infection might have been of the liver and thence passed by direct or lymphatic spread to the gall-bladder wall. It could, however, be argued equally well that the infection had spread from the gall-bladder to the liver—a path which I think is more probable, in that the liver changes are always most marked in the immediate vicinity of the gall-bladder. The long-standing work of Rosenow, showing that cholecystitis could be produced by the injection of specific organisms into the blood stream, and Mann's interesting observation that an acute cholecystitis rapidly followed the injection of Dakin's solution into the blood stream, strongly suggest that the infection is through the systemic blood stream. Many clinicafacts support these views. It has been known for years that cholecystitis might follow influenzal and pneumonic infections and that the organisms of these diseases might be found in the gall-bladder.

Some years ago I was impressed with the frequency with which gall-bladder changes were associated with urinary symptoms. Of the series of 347 cases I examined, 73, or 21 per cent., showed such symptoms, and of a smaller series in which the urine was specially examined *B. coli* was found in 75 per cent. Even at this time clinical facts, therefore, seemed to support the view that a cholecystitis was only the later result of a mild general septicæmia, usually due to the *B. coli* group of organisms. Of late years it is becoming widely appreciated that gall-bladder symptoms, especially in their early stages, are often associated with other evidence of general infection. They may occur with osteo-arthritis, tonsillitis, dental sepsis, and gastro-intestinal disturbances. Evidence, therefore, that a cholecystitis is only a part of or the late result of a mild general septicæmia appears to be very strong, the great point of interest being that whereas a few years ago the indications were that such infections were most commonly of the *B. coli* or typhoid group, to-day they seem more generally to be the late results of a chronic streptococcal infection.

RECURRENCE OF CALCULI.

This modern evidence in support of the view that chronic cholecystitis is inflammatory in origin and is the late expression of a mild general septicæmia throws light upon the interesting questions of the important bearing of foreign bodies in the gall-bladder and the formation of recurrent calculi. The importance of foreign bodies within the lumen of the bladder has been recognised for many years, and it has even been believed that the dead bodies of micro-organisms formed the centre of every calculus. The evidence of this is uncertain, but it is clearly proved that any unabsorbable suture may act as a focus for the formation of calculi. In the olden days when cholecystostomy was a routine operation, a silk suture used occasionally to be used for fixing in the drainage-tube. Several cases have been reported where at a later period there was evidence of the reformation of calculi, and at a second operation a calculous mass was found around the suture. One such case occurred in my series, and in the specimen it is evident that the calculous material is formed around a looped suture. This method of formation of stones was first reported by Homans and confirmed by the experimental work of Mignot, but since that time many other examples have been reported. It is interesting to note in the light of our modern knowledge that the majority of such sutures were in the substance of the gall-bladder wall, and probably did not project into the lumen. Nevertheless, in Mignot's experiments the suture was placed actually in the cavity of the gall-bladder. Clinically his experiments have to a certain extent been reproduced by Nature, in that cases have been reported where a round worm has crawled up the cystic duct into the cavity of the gall-bladder and the dead body has formed the nucleus of a calculus.

Recurrent calculi in a few cases may actually be formed in the ducts. The best example of such a true recurrence is in the case of acholuric jaundice, where the gall-bladder has been drained or removed and the spleen left untouched. They may also occur if there has been a definite cholangitis. In both these cases the calculi are formed of pure pigment-calcium and not uncommonly form a soft putty-like mass. The greater number of clinical recurrences are either due to stones having been overlooked at the first operation, either in the bladder or ducts, or to a true reformation in the gall-bladder. Stones may easily be overlooked even in the gall-bladder itself if it be acutely inflamed; much more readily does this happen in an abnormally long cystic duct or in the common duct if the gall-bladder be drained or even removed without exploration of the ducts. My own experience has been that stones may occur in the common duct and yet give rise to none of the characteristic symptoms. In my own series of 95 common duct stones there were 29 which were unassociated with jaundice. Nor is it always possible to feel the stones from without. I have not uncommonly found a duct which has appeared perfectly normal upon external palpation, but upon the introduction of a pair of forceps a calculus has been removed. If a cholecystostomy be performed, a routine exploration of the duct can only be carried out by making a separate incision into the common duct, a step which would often appear to be unjustifiable. Overlooked stones which have remained in the common duct or in the stump of the cystic duct can be distinguished from true recurring calculi by the fact that they generally contain some cholesterol as an indication that they were formed within the gall-bladder. True recurring stones in the gall-bladder are usually of the same structure as those removed at the first operation, and therefore it may be impossible to say with certainty whether they were overlooked at the first operation or have been formed since. They form much the higher proportion of so-called recurring calculi. In my own 28 cases of recurrence 22 occurred in the gall-bladder after cholecystostomy; of these, 4 took place in a total of 51 cholecystostomies which I had performed myself, this giving a recurrence-rate of nearly 6 per cent.—a further indication that the formation of calculi is dependent upon the presence of an inflamed gall-bladder and not, as a rule, upon any metabolic error. The removal of the gall-bladder would seem to be clearly indicated as the routine operation, not only because it alone gets rid of the seat of the chronic inflammation, but it allows an easy routine examination of the bile-duct so that calculi are less likely to be overlooked.

SYMPTOMATOLOGY.

It is unnecessary to-day to point out that colic or jaundice or the presence of suppuration in the gall-bladder are not the symptoms of gall-stones but of their complications, and therefore do not enter into our present discussion.

It is now being realised that in the early stages the symptoms are often only a part of some general septic infection. The association of cholecystitis with a general chronic arthritis has been discussed by Wilkie and is to-day well recognised. In other cases there is either a past history of frequent attacks of sepsis of the tonsil or of the mouth and teeth, or indeed the patient may be actually under treatment with these conditions. I have seen a considerable number of cases of late in which patients have been under treatment for several weeks with mild attacks of pyrexia, a general feeling of malaise, evidences of dental and tonsillar sepsis, and later have developed dyspeptic symptoms and then pain and tenderness localised over the gall-bladder. The frequency with which cholecystitis has a history of onset after a certain pregnancy, and especially one associated with a *B. coli* infection, has already been mentioned, but to-day it seems more common for the symptoms to follow what is usually described as an influenzal attack.

Even when the infection is localised to the gall-bladder the symptoms in the earlier stages are ill-defined and likely to be overlooked. They consist of general dyspeptic disturbances, which at first may consist of a feeling of fullness, nausea, and vomiting, and a loss of appetite, but shortly after onset there is a distinct pain which commences in the epigastrium, passes to the right hypochondrium, and is associated with deep tenderness over the liver and gall-bladder. It is probable that at this period there is a catarrhal cholecystitis. Later the symptoms become more localised, the pyrexia tends to disappear, and the patient is left with a characteristic dyspepsia of cholecystitis. This shows itself as a feeling of fullness and distension after meals, which persists day by day without any intermission. The discomfort occurs immediately after meals or even before the meal is completed. It is often associated with a persistent occipital headache. During this more prolonged period exacerbations of the general or local infection are likely to occur, so that there may be pyrexial attacks of unknown origin associated with an increase of the general malaise. If the inflammation be more localised there will be an increase of the pain and tenderness in the gall-bladder area, and with each attack the characteristic gall-bladder hyperæsthesia may be evident. The cause of the dyspeptic symptoms during this period is but ill-understood. It is natural to suppose that the symptoms are dependent upon the contractions of a diseased gall-bladder which probably occur during or shortly after the ingestion of food. The complicated experimental work tending to show that the gall-bladder has no inherent power of contraction does not negative this supposition, for with the introduction of cholecystography it has been made quite evident that the partaking of certain foods, especially fat and yolk of egg, will cause emptying of the gall-bladder (Boydon). It has, however, been my experience that a large number of patients have continued to suffer from this flatulent dyspepsia for some weeks, or sometimes even for two or three months, after removal of the gall-bladder, and the fact that some 40 per cent. of cases of chronic cholecystitis have an absence of free acid in their test-meals would make it evident that they are the subjects of a chronic gastritis which possibly may be a relic of a general infection and which tends to persist for a short time after removal of the gall-bladder.

FINDINGS AT OPERATION.

The pathology of the gall-bladder in this stage of the disease is of considerable interest. If the condition be operated upon during an exacerbation, the gall-bladder, instead of presenting the characteristic deep blue appearance due to the bile shining through the thin wall, is seen to be thick, opaque, and œdematous. One or more enlarged lymph glands may be felt adjacent to the cystic duct, but according to Baumgartner, in 40 per cent. there are no stones. It is very probable that this condition is purely catarrhal and may heal between the attacks. It is evident, therefore, that the treatment should not be surgical unless there is very definite evidence that the change is not only recurrent but is maintaining the general infection. In other cases the typical "strawberry" gall-bladder may be present. This is very difficult to diagnose from the external appearance. Like the last group, the gall-bladder wall is thick and opaque and may show an œdema and enlargement of the lymphatic glands. More commonly, however, there is some early fibrosis, so that the gall-bladder wall is already harder and thicker than normal, and may show some distortion. As only 50 per cent. of this variety are associated with gall-stones, the absence of calculi cannot be taken as evidence that the gall-bladder is normal. In the later stages there may be distinct fibrosis with the formation of stones, the condition passing on to that of the well-known chronic cholecystitis. Since in the early stages the changes are so ill-defined, it is important to recognise the evidence which at operation may be accepted as warranting a diagnosis of cholecystitis. If stones are present, the nature of the lesion is, of course, evident. In my experience a gall-bladder which is not acutely inflamed or whose ducts are not completely obstructed can always be emptied by gentle pressure and the stones therefore palpated. Since, however, calculi are absent in a large number of these early cases, reliance will have to be placed upon other changes. In order of importance I would place these as: (1) changes in colour; (2) thickening from fibrosis or œdema; (3) the presence of enlarged glands; and (4) fibrosis of the adjacent liver. Of this latter change I am not nearly so confident as others appear to be. That a certain amount of fibrosis of the liver is very common in chronic cholecystitis is a fact accepted by all, but I am certain that a similar change may be found where there is a Riedel's lobe to the liver and where the liver has dropped as a whole.

A consideration of these pathological changes will make it evident that a clinical diagnosis at this stage is far from being easy. In the early periods the problem before us is that we have a patient suffering from prolonged and relapsing septic infection, the primary source of which it is very often difficult to locate, and a careful examination of the tonsils, teeth, and accessory nasal sinuses is generally required before the gall-bladder can be considered as the seat of infection. When the dyspeptic symptoms dominate the clinical picture, the diagnosis from a chronic gastritis, from visceroptosis, and from chronic pancreatitis may be associated with considerable difficulty. At one time it was thought that the Meltzer-Lyon test would be very helpful in these cases, but in my own relatively small experience it has been of very little help. Undoubtedly to-day the greatest help is obtained by cholecystography, but, as with all valuable means of investigation, there is some danger that too much reliance may be placed upon this method. When it is remembered that this test is dependent upon the fact that a dye which is opaque to the X rays is excreted by the liver into the bile, and that the bile containing it is concentrated to a marked degree by the normally functioning gall-bladder, it will be realised that in this country, where the dye is nearly always administered by mouth, a shadow of the normal gall-bladder indicates that the dye is being adequately absorbed from the intestine, that it is being normally secreted by the liver, that the liver secretions are passing freely into the gall-bladder, and that the gall-bladder is adequately concentrating the bile. An error in any one of these steps would lead to an absence of the normal gall-bladder shadow, and hence the absence of the shadow alone must not be regarded as definite evidence that the function of the gall-bladder is at fault. In the same way irregularities of outline do not of necessity mean a chronic inflammation of the gall-bladder. Alterations in its shape due to congenital deformities or to the presence of congenital cystico-colic or cystico-duodenal bands, which are of little or no clinical importance, are well recognised and may be a source of fallacy. I am confident that to-day far too many gall-bladders are being operated upon simply because there is an absence of the normal shadow or because the gall-bladder shows some irregularity in outline.

TREATMENT.

The diagnosis of gall-bladder lesions has now reached the stage which gastric lesions occupied a few years ago, and there is a tendency to advocate operation as soon as any inflammatory change or an error of function is recognised. As with early lesions of the stomach and duodenum, it must be remembered that although distinct changes may be diagnosed and their presence confirmed by cholecystography, they may still be curable by medical treatment. That some of these milder degrees of cholecystitis may be so cured is beyond question. Whether the lipoid deposits causing a typical "strawberry" gall-bladder can also be cured without operation is less certain, but my own belief is that operative treatment should only be considered in these early stages if adequate relief is not gained by medical measures. If the symptoms of general infection do not abate, or if they frequently recur, if there is marked tenderness over the gall-bladder, and if these symptoms are associated with distinct evidence of an alteration in the functioning of the gall-bladder, then an operation should be undertaken. On the other hand, once there is evidence that stones are present, either owing to the presence of attacks of colic or to a positive appearance of calculi on a simple X ray plate, or as negative shadows after cholecystography, I am sure that operative treatment will be required sooner or later.

The evidence I have put before you as to the method of formation of calculi is, to my mind, convincing that when once they are present they can never be dissolved, nor have I ever been able to obtain evidence that a patient once having had calculi has been able to pass them and to be cured of the underlying gall-bladder trouble. It is therefore far better to operate in this stage where there is only a mild cholecystitis, rather than to await the onset of severe and often dangerous complications.

The actual technical details of the operation will become evident from the pathological considerations I have put before you. Some years ago it was the custom, if the gall-bladder appeared but slightly changed, to remove the stones and to drain the viscus in the belief that the inflammatory changes would disappear, cholecystectomy being reserved only for the more advanced stages of the disease. When once it is accepted that the presence of stones is due to inflammatory changes, and that these changes are dependent upon a blood-borne infection which is carried to the wall of the gall-bladder, it will be evident that a cure by draining of the viscus is most improbable, and indeed the frequency with which the recurrence of calculi is found after simple cholecystostomy supports this view. We may say, therefore, that the ideal operation, both from theoretical and practical knowledge, is a cholecystectomy. Unquestionably this is an operation requiring greater care and technical knowledge than a cholecystostomy, but if it be accepted as an axiom that no duct be ever divided until the cystic, common, and hepatic ducts are all exposed, the danger of any operative accident is very greatly lessened. Since it is difficult, if indeed not impossible, to eliminate the presence of stones in the common duct by means of the clinical history or by means of external palpation, the common duct, wherever possible, should be explored through the stump of the cystic duct. My own view is that this step should also be followed by dilatation of the ampulla, so that there is a free passage of the bile into the duodenum. This, then, I would regard as the ideal operation, but in some cases it may not be possible. With very stout patients and those suffering from any severe complications, the carrying out of the whole of this procedure may be associated with very considerable risk to life, which is greater than that of overlooking stones in an unexplored common duct. In patients who are suffering with an acute or even gangrenous cholecystitis, the general condition may be so bad that the surgeon has to be satisfied with a cholecystostomy, although it is almost certain that a more radical operation may be required at a later date. The first consideration in such conditions must always be the safety of the patient.

Whatever operative steps have been performed, I am strongly of the opinion that it is always wise to insert a drainage-tube down to the cystic duct for a few days; however carefully the stump of the cystic duct be sutured a certain amount of leakage of bile may take place. There is no doubt that this not uncommonly occurs from small bile-ducts opening into the gall-bladder bed, and therefore is not dependent upon carelessness in the closure of the cystic duct. Should there be no tube a considerable amount of irritation or even an abscess may later arise. If the progress is uninterrupted it may be removed in two or three days; it has never in my experience led to the slightest disability, and can safely be used as a routine step.

SUMMARY.

I would briefly summarise these views by stating that: (1) cholelithiasis is, in the majority of cases, dependent upon inflammation of the gall-bladder; (2) this inflammation is due to a blood-borne infection; (3) it is at first a part of a general infection or mild septicæmia; (4) in the early stages of cholecystitis medical treatment should always be attempted; (5) when once stones have been formed surgical interference should always be sought; (6) the ideal surgical treatment consists of cholecystectomy, exploration of the common duct, and dilatation of the ampulla.

A STUDY OF
CALCIUM METABOLISM IN THE ACUTE STAGES OF CHOREA IN CHILDREN.*

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FOR many years it has been remarked that there is a certain type of child who is especially liable to rheumatism. This has been expressed as a "rheumatic diathesis." In the absence of definite evidence of the nature of the infecting agent, the most satisfactory method of attacking the cause of the disease seems to lie in investigation of the underlying metabolic condition. The presence of such an underlying condition is generally accepted as the only way of explaining some of the peculiar features of this disease—e.g., its extreme frequency in the poorer and its absence in the better classes of the populace, and also its relation to climate.

It has been shown that in chorea there is an increased electrical excitability of the neuro-muscular junction during the active stages of the disease, and that this gradually passes off as recovery ensues.[1] It therefore seemed advisable to study the relationship of these results to the calcium metabolism of the children. The part played by calcium in regulating the excitability of nerves and muscles has been studied in experiments on animals and also in human beings; some of the more important results are as follows.

Animal Experiments.

Biedermann[2] first showed in 1880 that a curarised sartorius muscle in a sodium salt solution free of calcium shows increased irritability and undergoes rhythmical contraction. Loeb[3] demonstrated the same phenomenon with an isotonic sodium salt solution, and showed that it was prevented by adding 10 mg. of calcium per cent. He concluded "that we are indebted to the calcium in our blood to prevent our muscles constantly twitching." Keith Lucas[4] showed that the minimal stimulus required to produce excitation of a nerve increases in proportion to the amount of calcium in the solution bathing it. Again, if blood from a parathyroidectomised animal be perfused through the leg of a normal animal, it produces a rise in the excitability of the muscle. This excitability is diminished by adding calcium.[5] After removal of the parathyroids in a dog, there is a fall in the serum calcium from 10–12 mg. per cent. to 5–8 mg. per cent., and the resulting tetany is relieved *temporarily* by intravenous injections of calcium.

Results in Man.

Howland and Marriott[6] showed that in active infantile tetany the muscles responded to an electrical stimulus obtained with the cathode opening current (C.O.C.) of less than 5 milliampères; after recovery the C.O.C. has to be greater than 5 milliampères to produce a response. At the same time they showed that in active tetany the average value of the serum calcium was 5·6 mg. per cent., as compared with a value after recovery of 10·2–11·0 mg. per cent.

This is sufficient to prove the profound effect that a lack of calcium produces in increasing the electrical excitability of muscles and nerves. The question naturally arises of how far the increased electrical excitability met with in chorea is related to a calcium deficiency. The calcium in the blood is almost entirely present in the serum and the plasma, the cells containing but a small fraction of the total blood calcium.[7] That part of the blood which comes into contact with the tissues is the plasma, and so it is the calcium content of plasma which should be measured. The serum calcium is directly proportional to the plasma calcium, although giving slightly lower values,[7] and it is much more convenient to measure the serum content, as most methods for preventing coagulation depend upon precipitation or alteration of the state of the calcium (as by sodium oxalate and sodium citrate).

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The calcium in the serum is present in at least two forms: (*a*) That fixed by protein. The amount present in this form is directly proportional to the amount of protein present,[8] and is rendered inactive by its combination with protein. (*b*) Inorganic calcium. This is largely present as phosphate and bicarbonate, and is of special importance as it gives rise to the active calcium ions of the blood. Marrack and Thacker [9] believe that all the inorganic calcium of the blood is ionised, but Percival and Stewart [7] and Brinkman and van Dam [10] believe that only part is ionised. Whichever view is correct, the amount of ionic calcium present is certainly in proportion to the amount of inorganic calcium. It is therefore important to study not only the total serum calcium, but especially the inorganic calcium of the blood. The inorganic calcium can be separated from the blood by dialysis in vivo, as has been performed by Percival and Stewart [7] through the living peritoneal membrane, or in vitro through a collodion membrane (D. J. de Waard,[11] Cushny,[12] Walpole [13]). There is always the danger that the state of the calcium may be altered during the time (which amounts to a matter of hours) that the dialysis is occurring. When working on human beings, Marrack and Thacker proved that the amount of calcium present in an inorganic form in the serum is the same as that present in normal cerebro-spinal fluid.

The results obtained by these different observers may be summarised thus (Table I.).

TABLE I.

Inorganic Calcium of Blood.

—	Mg. per cent.	Method.
Percival and Stewart	6·4 7·4	In vivo dialysis in cats under anæsthesia. Collodion membrane in man.
Marrack and Thacker	5·8	In vitro dialysis through collodion membrane in man.

Cerebro-spinal Fluid.

—	Mg. per cent.		Method.
Matsuhashi [14] ..	5·2	—	Unanæsthetised dogs.
	Average.	Range.	
Neale and Esslemont [15]	5·7	5·1–6·5	Non-meningitis cases without convulsions.
Neustaedter [16] ..	5·8	—	Normal men and children.

It is important to note that the calcium content of the cerebro-spinal fluid is not affected by repeated lumbar puncture.[17] Matsuhashi showed that after removal of the parathyroids and part of the thyroid in dogs the cerebro-spinal calcium fell from 5·2 to 4·2 mg. per cent., coincident with the onset of tetany.

Methods in this Investigation.

The method of estimating the calcium in the present investigation has been that of Bainbridge and Trevan,[18] which gives reliable results to within ± 0·10 mg. per cent. For each estimation only 1 c.cm. of fluid is needed; two or three determinations have been made wherever possible and the results averaged.

The method consists in the precipitation of the calcium by saturated ammonium oxalate and then washing the calcium oxalate precipitate twice with a saturated solution of ammonium oxalate. The calcium oxalate is dried and heated and so converted into the carbonate. The amount of this is estimated by dissolving in an excess of N/100 phosphoric acid and backward titrating the excess of acid with N/100 sodium hydrate to an end-point of pH 3·97* (indicator brom-phenol blue).

There are several precautions to be adopted.

(*a*) Firstly it is essential to separate the serum from the blood soon after it is shed, otherwise the serum calcium value falls fairly rapidly. Apparently the calcium goes into the clot. The effect of allowing the serum to stand in contact with the clot is shown in Table II.

TABLE II.

		Mg. per cent.
Serum obtained	Immediately after drawing blood ..	10·99
	After leaving clot with serum for 12 hours in ice-chest	10·40
	After leaving clot with serum for four days in ice-chest	9·06

If the serum is separated immediately, and it or the cerebro-spinal fluid stored in an ice-chest, the calcium content remains practically constant (Table III.).

TABLE III.

	Mg. per cent.
Cerebro-spinal fluid calcium content	5·43
Ditto after 27 days in ice-chest	5·33
Blood-serum calcium content	8·68
Ditto after standing in room for 5 days	8·69

(*b*) Secondly, at least 16 hours must be allowed for complete precipitation of the calcium as oxalate. In this series of estimations 24 hours have elapsed in every case.[7] It seems very probable that the neglect of these precautions accounts for many of the anomalous results of calcium estimations recorded in the literature.

Results.

Total Serum Calcium.—The total serum calcium varies with the method used. Many observers have not allowed complete precipitation to occur, and so have obtained low values. The results obtained in this series are summarised in Table IV.

TABLE IV.

Cases.	Average age in years.	No. of cases.	Serum calcium in mg. per cent.	
			Average.	Range.
Severe chorea ..	10	15	9·66	8·68–10·21 (+1 case 11·18)*
Mild chorea ..	8	9	9·79	9·36–10·37
Recovered cases of chorea ..	9	14	10·14	9·12–10·89
Healthy medical students ..	17	6	10·49	9·66–11·50
Convalescent cases of bone disease	14	12	10·01	9·40–10·74

* This case subsided in two weeks without treatment.

TABLE V.

Case.	Serum calcium in mg. per cent.		
	During active chorea.	After chorea subsided.	Time after active chorea and treatment stopped.
1	9·10	10·24	6 weeks
2	9·42	9·70	9 months
3	9·70	10·41	10 weeks
4	8·84	9·69	3 months
5	10·21	10·63	2 ,,
6	11·18	10·19	4 ,,
Aver.	9·74	10·14	—

The control really required is a series of middle-class children of the same age, as it appears possible from Table IV. that all poor children have a low value for the serum calcium, especially as Howland and

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* This was chosen as a convenient end-point as it is the pH of a N/20 solution of potassium hydrogen phthalate. If kept in a paraffined bottle the pH of the solution remains constant for three weeks.

Kramer[19] found distinctly higher values in children than in adults. The values in the children during active chorea and again after recovery are shown in Table V.

Tables IV. and V. show that the serum calcium rises as recovery occurs, the rise being on an average 0·48 (Table IV.) and 0·40 (Table V.) mg. per cent.

Calcium Content of Cerebro-spinal Fluid.—It is important to obtain the normal figure before proceeding to estimate the value in cases of chorea. It is extremely difficult to get samples of cerebro-spinal fluid from perfectly normal children, and the nearest approximation is to use pathological fluids of low protein content from a large variety of cases. The values are shown in Table VI.

TABLE VI.

Case.	C.S.F. calcium in mg. per cent.	Disease.
11	5·43	Tuberculous meningitis.
12	4·54	
13	5·55	
14	5·17	
15	5·83	Specific encephalitis.
16	4·89	Juvenile taboparesis.
17	5·81	Meningococcal meningitis.
18	5·32	Mental deficiency.
19	5·53	Recent poliomyelitis.
Average	5·34	—

These values approximate to the results of other workers. Neale and Esslemont[15] found an average value of 5·7 mg. per cent. (range 5·1 to 6·5 mg. per cent.) in a series of non-meningitic pathological fluids; and Neustaedter[16] obtained an average value of 5·8 mg. per cent. for normal men and children.

In the cases of chorea the following values have been obtained (Table VII.).

TABLE VII.

—	No. of cases.	Calcium content of cerebro-spinal fluid in mg. per cent.	
		Average.	Range.
Severe chorea	18	4·61	4·36–4·75
Recovered cases of severe chorea (within 6 months of recovery)	7	5·18	4·87–5·48
Mild chorea	3	5·04	4·86–5·40

N.B.—In most cases the samples were obtained by lumbar puncture under local anæsthesia. Occasionally, with a severe case, a short general anæsthetic with ethyl chloride had to be administered.

From this it is seen that the values in cases of severe chorea are all subnormal and that they rise by an average of 0·59 mg. per cent. (=12·8 per cent.) when recovery occurs.

The values obtained in a series of cases studied during the stages of severe active chorea and again after recovery are shown in Table VIII.

TABLE VIII.

Case.	C.S.F. calcium in mg. per cent.		Time after recovery and treatment stopped.
	Severe active chorea.	After recovery.	
6	4·75	5·43	4 months
5	4·72	5·31	2 ,,
7	4·70	5·04	6 weeks
1	4·53	4·87	4 ,,
8	4·43	5·48	4 ,,
9	4·69	5·15	10 ,,
20	4·67	4·96	6 ,,
Average	4·64	5·18	—
Range	4·43–4·75	4·87–5·48	—

There is evidently a rise in the average calcium when the chorea subsides, to the extent of 13 per cent. of the value during active chorea. The ultimate values in the series shown in Tables VII. and VIII. are still a little lower than the average figure obtained from a series of pathological samples of cerebro-spinal fluid. This may well be related to the rather short time elapsing between the subsidence of chorea and the taking of the final sample.

Perhaps the most striking relationship is shown by following the cases through and comparing the values obtained in the active phase and during the subsidence of the disease (Table IX.).

TABLE IX.

Case.	Date.	C.S.F. calcium in mg. per cent.	Remarks.
10	July 8	4·71	Severe chorea.
	Aug. 3	4·62	No improvement.
	Sept. 9	5·74	Free of chorea.
9	April 30	4·69	Severe chorea.
	June 13	4·85	Slight improvement.
	July 11	5·15	Free of chorea.
5	June 13	4·62	Severe chorea.
	July 22	5·05	Very slight chorea.
	Sept. 19	5·31	Free of chorea.

In many of these children Dr. A. A. Osman and Dr. H. G. Close have been kind enough to estimate the alkali reserve of the blood plasma by their modification[30] of the method of van Slyke, Stillman, and Cullen.[31] The results are shown in Table X.

TABLE X.

—	No. of cases.	Average age.	Plasma $NaHCO_3$ expressed in terms of molecular concentration.	
			Average	Range.
Severe chorea ..	6	13	0·0291	0·0271–0·0323
Mild chorea ..	7	11	0·0295	0·0258–0·0323
Recovered chorea ..	4	11	0·0298	0·0289–0·0322
Normal controls (non-rheumatic children of the hospital class of patient) ..	38	9	0·0290	0·0265–0·0320

In two cases Dr. A. C. Hampson has determined the pH of the blood plasma with the glass electrode, and in both cases a normal figure was obtained. This shows that the acid-base equilibrium of the blood plasma is normal in choreic children, just as it is in rheumatic children.[32]

Summary of Results and Conclusions.

In chorea there is a rather low value in the total serum calcium, which rises as the chorea subsides. The ultimate value reached is similar to those obtained in control cases of convalescent bone disease, both groups of case being drawn from the poorer classes of the population. These are lower than the values obtained in six healthy medical students of the age of 17. If the results of Howland and Kramer are confirmed and it is found that children should have higher values than adults, all children in poor circumstances may apparently have low values, and this fact may well be related to poverty and the debility associated with it. This is not at all unlikely; in the rapidly growing infant, where calcium is needed in the greatest quantity for bone formation, rickets is very common and infantile tetany is frequently associated with it.

The calcium content of the cerebro-spinal fluid in chorea is consistently low, and at the same time there is a rise in the electrical excitability of the peripheral nerves and muscles as measured at the "motor point." As recovery ensues, corresponding with the rise in the calcium of the cerebro-spinal fluid, the electrical excitability diminishes.[1]

The calcium content of the cerebro-spinal fluid is important from two points of view. In the first place, the calcium content of the cerebro-spinal fluid is, according to Marrack and Thacker, equivalent to the inorganic calcium content of the blood. The low values met with in chorea indicate that all the tissues of the body, including the brain, are supplied by a fluid deficient in inorganic calcium, and therefore in calcium ions. In the second place, the cerebro-spinal fluid is one of the main sources of nutriment to the brain and its cells. Surrounding the nerve-cells are perineural spaces, continuous with the perivascular spaces and containing cerebro-spinal fluid, as was demonstrated by Mott[20] and confirmed later by Weed.[21] The nerve-cells in cases of chorea are therefore bathed by a fluid which is 13–15 per cent. deficient in calcium. This in itself is sufficient to raise the excitability of the nerve-cells, in the same way that deficiency in calcium is known to raise the excitability of the peripheral neuromuscular apparatus. Moreover, Sabbatini[22] showed that the direct application to the surface of the brain of salts which produce precipitation of calcium causes an increased excitability of the cerebral cortex.

These results have a considerable bearing on the subject of chorea in children, and may well help in the elucidation of this disease, which the pathological findings do not in themselves always seem capable of explaining. Poynton and Holmes,[23] who described the autopsy findings, showed congestion of some parts of the brain with degeneration of some cortical nerve-cells. But recently Bernard Shaw,[24] in a very careful examination of the brain of a case of chorea, concluded that "no adequate anatomical basis for the chorea is found in the meninges, cerebral cortex, caudate nucleus, corpus striatum, optic thalamus, mesencephalon, and pons. All these showed hyperæmia, but no vascular or inflammatory lesions." If chorea were solely due to a bacterial invasion of the brain, evidence of this should be shown by an abnormality either of the protein or the cells contained in the cerebro-spinal fluid. These have been examined in a few cases in this series, and have always been found to be normal. This is in agreement with the findings of Levinson[25] in his series of cases, while Morse and Floyd[26] found a slight increase in the number of cells as the only abnormality in 3 out of 19 cases.

The presence of this calcium deficiency may help to explain some of the characteristic features of chorea. Chorea is met with during the period of growth, when there is a special need of calcium in all the tissues of the body. After the age of 25, when ossification ceases, chorea is very rarely seen except during pregnancy, when again there is a drain on the calcium reserves of the body in order to supply the fœtus. Also, just as rickets is largely confined to the poorer classes at an early age, so is chorea at a later age. It may be that, just as rickets is associated with faulty calcium metabolism at an early age, so is chorea at a later age. This is not in any way denying that there is an infection associated with chorea and acute rheumatism, for this infection must almost certainly be the explanation of the valvular lesions in the heart. But it does seem probable that the nervous, restless, over-active child, with its long period of debility preceding the signs of infection,[27 28] may be suffering from a calcium deficiency which itself may be accentuated by the infection. This is parallel with the low state of health associated with rickets, and it is well known that rickety children are very prone to infective disorders. This hypothesis can only be confirmed by further work, but it is in keeping with the results of Thompson and Leighton,[29] who showed that a chronic parathyroid deficiency, due to ligature of the vessels of the parathyroids, produces a progressive loss of weight and diminished resistance to infection. The cause of the calcium deficiency met with in chorea and its relationship to the treatment of chorea are still under investigation.

In conclusion, I should like to thank the following for permission to investigate cases under their care: Dr. E. P. Poulton, Dr. N. Mutch, Dr. J. A. Ryle, Dr. H. C. Cameron, Dr. J. M. Campbell, and Dr. A. H. Douthwaite at Guy's Hospital; Dr. M. Davidson at the Miller Hospital; Dr. A. C. Hampson and Dr. A. A. Osman at Queen Mary's Hospital, Stratford; and Dr. W. T. Pugh and Dr. N. Gray-Hill at Queen Mary's Hospital, Carshalton.

References.

1. Carter-Braine, J. F., Spurrell, W. R., and Warner, E. C.: Guy's Hosp. Rep., 1929, lxxix., 473.
2. Biedermann, W.: Sitzungsb. der Wien. Akad. der Wissens, 1880, lxxxii., 3.
3. Loeb, J.: Beit. z. Physiol. Fests. 1 Adolf Fick, 1899.
4. Lucas, K.: Jour. Physiol., 1910, xl., 225.
5. MacCallum, W. G., and Vogel, K. M.: Jour. Exper. Med., 1913, xviii., 618.
6. Howland, J., and Marriott, W. McK.: Quart. Jour. Med., 1918, xi., 289.
7. Percival, G. H., and Stewart, C. P.: Biochem. Jour., 1928, xxii., 548.
8. Salvesen, H. A., and Linder, G. C.: Jour. Biol. Chem., 1923, lviii., 617.
9. Marrack, J., and Thacker, G.: Biochem. Jour., 1926, xx., 580.
10. Brinkman, R., and van Dam, E.: Proc. K. Akad. Wetensch., *Amsterdam*, 1920, xxii., 762.
11. de Waard, D. J.: Arch. Néderl. de Physiol., 1918, ii., 530.
12. Cushny, A. R.: Jour. Physiol., 1920, liii., 391.
13. Walpole, G. S.: Biochem. Jour., 1915, ix., 284.
14. Matsuhashi, M.: Japanese Jour. Med. Sci., 1929, Pharmac., vol. iii., No. 2, 53.
15. Neale, A. V., and Esslemont, M. S.: Arch. Dis. Child., 1928, xvi., 243.
16. Neustaedter, M., Hala, W., and Tobstoouchow, A.: Jour. Amer. Med. Assoc., 1925, lxxxv., 347.
17. Halverson, J. O., and Bergeim, O.: Jour. Biol. Chem., 1926, xxix., 337.
18. Bainbridge, J. W., and Trevan, H. W.: Biochem. Jour., 1926, xx., 423.
19. Howland, J., and Kramer, B.: Amer. Jour. Dis. Child., 1921, xxii., 105.
20. Mott, F. W.: THE LANCET, 1910, ii., 1.
21. Weed, L. H.: Physiol. Reviews, 1922, ii., 171.
22. Sabbatini, L.: Med. Acad. Reale de Torino, 1904, liv., ii., 459.
23. Poynton, F. J., and Holmes, G. M.: THE LANCET, 1906, ii., 982.
24. Shaw, B.: Arch. Dis. Child., 1929, iv., 155.
25. Levinson, A.: Cerebro-Spinal Fluid, London, 1929, p. 350.
26. Morse, J. L., and Floyd, C.: Amer. Jour. Dis. Child., 1916, xii., 61.
27. Vining, W.: Brit. Med. Jour., 1929, i., 629.
28. Campbell, M., and Warner, E. C.: THE LANCET, Jan. 11th, 1930, p. 61.
29. Thompson, R. L., and Leighton, W. E.: Jour. Med. Res., 1908, xix., 121.
30. Osman, A. A.: Guy's Hosp. Rep., 1925, lxxv., 306.
31. Van Slyke, D., Stillman, E., and Cullen, G. E.: Jour. Biol. Chem., 1919, xxxviii., 167.
32. Parsons, L. G., and Edgar, S. H.: Arch. Dis. Child., 1929, iv., 291.

A PERNICIOUS TYPE OF ANÆMIA FOLLOWING ERYTHRÆMIA.

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THE association of various forms of blood disease and the change from one to another have been described by many writers. Excessive activity of the myeloid common stem cell, the hæmocytoblast, results in the flooding of the peripheral blood with its derivatives; polycythæmia follows over-activity of the erythropoietic function; myeloid leukæmia from over-activity of granulocytopoiesis. When stimulation of both functions (pan-myelosis) occurs, with a resulting blood picture of a mixed erythræmia and myeloid leukæmia, the condition is known as erythro-leukæmia,[1–5] or subleukæmic erythræmia.[6] Cases have also been described in which erythræmia has supervened in myeloid leukæmia,[7–9] and others in which the reverse has occurred.[10–16] A similar reaction of both erythro- and granulo-poietic tissues is sometimes seen in pernicious anæmia when the differential leucocyte count has the characteristics of myeloid leukæmia; this has been termed "leukanæmia."[17] The appearance of large numbers of megacaryocytes in the peripheral blood with a great increase in their derivatives, the blood-platelets, may be the essential feature of a myelosis known as "piastrinæmia."[18–20]

Freund,[21] in 1919, was the first to describe the transformation of established polycythæmia of many years' standing into an anæmia closely resembling pernicious anæmia. Minot and Buckman[14] described three further cases in 1923, and Delhougne, Gotschlich, and Froboese[22] recorded two cases in 1928. As no case has been described in this country, the following one, which I observed over a period of five years, and then examined post mortem, is of interest.

Clinical History.

A stonemason, aged 60, was admitted into Charing Cross Hospital under the care of Dr. W. J. Fenton, in June, 1923, complaining of general debility, breathlessness on exertion, giddiness, and attacks of vomiting of about six months' duration. There was nothing of note in the past and family history. The complexion and tongue were of a purple hue, the spleen was not palpable, the heart was not enlarged, a right inguinal hernia was present, the blood pressure was 160 mm. Hg systolic and 100 mm. Hg diastolic. The blood count showed 7,300,000 red cells per c.mm. (for details see Table). After ten weeks as an in-patient, during which time a radical cure of the hernia was performed, the patient was sent to a convalescent home, and then reported fortnightly.

In November, 1923, he complained of pain in the left hypochondrium and the presence of a "lump"; on examination a tender spleen could be felt extending three fingers-breadth below the costal margin. The enlargement continued until the spleen reached across the middle line below the umbilicus. There were occasional complaints of pain over the spleen, "as if the stomach was on the boil," most marked on pressure or stooping; these attacks coincided with tenderness of the spleen, but not with any noticeable alteration in either the size of the spleen or the blood count. Sleeplessness became a marked symptom, and several attacks of bronchitis occurred. Treatment was symptomatic and venesection was frequently performed.

Date.	Red blood cells (millions).	Hæmoglobin (per cent.).	Colour-index.	White blood cells.	Polymorphonuclears (per cent.).	Eosinophils (per cent.).	Basophils (per cent.).	L. hyalines.	Lymphocytes.	Myelocytes.	Normoblasts per 100 white cells.	Megaloblasts per 100 white cells.	Poikilocytosis.	Poly-chromatophilia.	Anisocytosis.
8/6/23	7,190	82	0·57	18,500	81·0	4·34	2·34	3·0	9·31	..	..	..	+	..	+
20/6/23	7,100	84	0·6	17,200	85·5	2·5	..	1·5	10·5	..	..	..	+	..	+
5/7/23	7,300	82	0·56	15,100	81·0	4·0	1·0	2·0	12·0	..	..	..	+	..	+
7/8/23	7,100	78	0·56	12,100	83·0	4·5	1·0	1·25	10·25	..	..	..	+	..	+
5/11/23	7,312	82	0·56	16,100	87·0	4·0	0·5	1·5	7·0	..	..	..	+	..	+
3/12/23	6,860	80	0·58	16,300	88·8	3·4	1·0	0·8	6·0	..	..	..	+	..	+
15/4/24	8,380	84	0·5	10·700	88·2	4·4	1·2	1·6	4·6	..	..	..	+	..	+
31/10/25	9,250	80	0·43	17,400	83·34	4·0	0·5	1·67	10·5	..	..	..	+	..	+
16/7/26	8,900	76	0·4	15,200	82·67	2·34	1·0	3·0	11·0	..	..	..	+	..	+
4/11/26	9,320	82	0·44	15,600	87·5	3·5	0·67	2·0	6·34	..	..	..	+	..	+
23/8/27	7,860	80	0·51	16,400	85·0	0·34	1·5	1·67	11·5	..	..	..	+	..	+
2/5/28	2,100	44	1·04	8,600	82·67	3·34	2·0	5·34	6·67	..	..	..	+	..	+
6/5/28	2,300	50	1·08	9,100	81·67	2·67	2·34	2·0	4·0	4·34	1	1	+	..	+
26/5/28	3,890	72	0·9	9,100	87·0	1·34	5·0	1·67	2·0	3·0	..	..	+	..	+
8/6/28	4,060	76	0·9	12,300	85·0	1·0	..	2·5	7·0	4·5	1	..	+	..	+
20/6/28	4,860	80	0·8	16,500	90·0	..	2·0	2·0	6·0	..	..	..	+	+	+
9/7/28	4,690	80	0·86	12,900	91·5	2·0	2·0	2·5	2·0	..	..	..	+	..	+
29/8/28	5,900	76	0·6	18,400	90·67	2·67	1·0	1·67	4·0	..	..	..	+	..	+

In July, 1925, œdema in the legs first began to appear, and from November, 1926, the patient began to suffer from attacks of gout, the right fifth metatarso-phalangeal joint being the most frequently attacked; colchicum and atophan (grs. 4, b.d.s. on alternate days) gave great relief. In June, 1927, there was an attack of herpes over the upper part of the left ear.

In April, 1928, there was a complete change in the clinical picture; instead of the purple appearance of the polycythæmic, the lemon yellow tint of pernicious anæmia was present. The patient complained of feeling very weak, of swelling of the feet, of increased shortness of breath, and of loss of weight. The tongue was glazed, cracked, and sore; the spleen was enlarged to 1½ in. below and to the right of the umbilicus; the lower border of the liver was felt two fingers-breadth below the right costal margin; the heart was not enlarged. The blood pressure was 140 mm. Hg systolic and 110 mm. Hg diastolic. A blood count showed: red cells, 2,100,000; hæmoglobin, 44 per cent.; colour-index, 1·01 (for further details see Table). Soon after admission into hospital pain appeared in the right chest, and a pleural effusion rapidly developed which I replaced by air; but it soon reaccumulated. The fluid contained 99·67 per cent. of lymphocytes, no tubercle bacilli were seen, and cultures were sterile. The van den Bergh test gave a slight positive indirect reaction, urobilin in the stools was increased, and the blood-cholesterol content was reduced to 0·07 per cent.

Treatment with liver diet was carried out, half a pound of liver being given daily either in soup, fried, baked, spiced raw liver sandwiches, or extract. The general condition improved greatly and, as shown in the accompanying table of blood counts, the erythrocytes increased in numbers. The patient discharged himself on July 12th to attend to certain family matters.

On August 24th, 1928, he returned with great abdominal distension, causing much pain. The hydropneumothorax was still present, the heart was displaced 1½ in. to the left, the liver and spleen were unaltered, and there was marked tympanites and free fluid in the abdomen. The tympanites was intractable to enemas and stupes, but was reduced temporarily by pituitrin and eserine injections; 35 oz. of fluid were drawn off from the right side of the chest and 35 oz. from the abdomen. The fluid and tympanites, however, soon reaccumulated, and pericardial friction sounds appeared on Sept. 20th. A week later signs of pericardial effusion were present, and death occurred on Oct. 3rd, 1928.

Finding at Autopsy.

Post-mortem examination was done three hours after death.

The body was wasted. The right pleural sac contained a large quantity of serous fluid, the pleura was thickened, and the lung collapsed (weight 650 g.). The left pleura was covered by a "buttery" fibrinous exudate, causing several soft adhesions. The left lung was œdematous and contained healed tubercle at the apex (weight 850 g.). There was no thickening of the pulmonary vessels. The pericardium was thickened and contained an excess of fluid. The heart (weight 200 g.) was small and atrophied; the muscle soft, and "thrush breast" markings present on the endocardial surface. There was early atheroma involving the mitral valve. The aorta was smooth with remarkably little atheroma. The coronary arteries were patent and tortuous, not atheromatous and not markedly thickened.

The peritoneal cavity contained a large excess of serous fluid and the intestines were matted together by a fibrinous exudate, causing loculation. The spleen (weight 1450 g.) was greatly enlarged, and its capsule enormously thickened, being one inch thick at the lower pole. The Malpighian bodies, where visible, were much enlarged. The liver was enlarged (weight 1700 g.), its capsule was thickened, and on section its markings were very distinct. The ferrocyanide test was indefinite. The kidneys appeared normal, the capsule stripped easily, leaving a smooth surface. The right contained a white infarct; in one of the calyces of the left kidney there was a large quantity of gravel. The stomach was small and atrophied and embedded in the thickened splenic capsule.

The left femur was completely filled with red marrow except for two small areas in the condyles, where yellow marrow remained; the same intense marrow activity was seen in the ribs, vertebræ, and sternum. Sections showed active hæmopoiesis in the bone-marrow, and a few areas of hæmopoiesis in the spleen. The lung tissue, apart from some congestion, appeared normal; there was no thickening of the pulmonary arterioles. There were slight but definite deposits of hæmosiderin in the liver cells.

Discussion.

The association of gout and erythræmia has been previously noted.[23–25] and Waltersdörfer,[25] describing a case before the Hufeland Society in Berlin, considered the gout to be the causative condition. In one of Weber's[26] cases polycythæmia rubra commenced with frequently recurring attacks of gouty arthritis. It is possible that this association is related to the increased purine metabolism following over-activity of the myeloid tissues and the excessive blood destruction.

One may readily conceive that the flooding of the peripheral circulation with the red cells produced by the hyperplastic marrow calls for increased activity on the part of the hæmolytic mechanism of the body. Anæmia may thus result if hæmolysis becomes so excessive that over-compensation occurs. The increase in the size of the spleen noted in some of these cases certainly suggests increasing hæmolytic activity, and cannot be due entirely to the myeloid and erythroblastic metaplasia which takes place. Evidence of increased hæmolysis is found in the icteric tint of these patients, the positive indirect van den Bergh reaction of the blood, the increase of urobilin in the stools, and the deposits of hæmosiderin in the liver. In the first case described by Delhougne, Gotschlich, and Froboese there was very marked deposition of hæmosiderin in the tissues. There is an increase of red cell fragility, and the presence of hæmolysins in the blood is demonstrated by the more ready hæmolysis of normal red cells in dilutions of erythræmic blood serum as compared with normal serum.[14] This hæmolytic power of the serum is also seen in pernicious anæmia and *Streptococcus hæmolyticus* septicæmia.[27]

Experimentally, a condition strikingly similar to this anæmia found following polycythæmia has been induced by repeated blood transfusions in animals. Hess[28] and Itami[29] described extreme plethora in rabbits, which, in spite of continued transfusions and the absence of isolysins developed into a marked anæmia and bone-marrow aplasia. Robertson,[30] in a more thorough description of this type of anæmia, has shown the relationship of plethora and anæmia to myeloid activity, as indicated by the percentage of reticulated cells. He found that agglutinins developed coincidently with the anæmia. Kambe and Komiya[31] demonstrated quantitatively the presence of these agglutinins. Ottenberg and Thalhimer,[32] working with cats, found no isohæmolysins in the blood of the normal animal, but that they often appear in the blood of recipient cats after transfusion. With the development of hæmolysins a marked anæmia appeared from which they quickly recovered after the cessation of transfusions. Since Boycott and Douglas[33] could find no evidence of isohæmolysins after transfusions, they concluded that transfused red cells were not destroyed by direct hæmolysis. Krumbhaar and Chanutin,[34] watching the effects of repeated transfusions of blood on the blood-destroying and blood-forming apparatus of normal and splenectomised dogs and rabbits, found a decrease or absence of reticulocytes from the blood stream during plethora, and an increase during "plethoric anæmia" evidently due to depression and activation respectively of bone-marrow activity. Increased blood destruction and elimination also occurred as measured by urobilin excretion, which was greatly increased during the stage of polycythæmia, and still more so with the development of anæmia. Deposits of blood pigment chiefly in the form of hæmosiderin were found in enormous quantities in the spleen, liver, lymph nodes, and bone-marrow.

It is possible that the anæmia in the case described is, partly at least, the result of an exhaustion of the erythropoietic activity of the myeloid tissues; yet of the cases which have come to autopsy, five in number (Freund, 1; Minot and Buckman, 1; Delhougne, Gotschlich and Froboese, 2; Avery, 1), in two only was an aplastic marrow found (Freund, D. G, and F.); the others showed very active erythropoiesis. Both the cases with aplastic marrow were complicated by syphilis, and it is likely that the antisyphilitic measures affected the bone-marrow, for Frank[35] has shown that salvarsan can produce an aplastic anæmia.

Though excessive irradiation may lead to an anæmia, this is likely to be a temporary phase only, the result of destruction of erythropoietic tissue, but the hæmolytic function of the spleen is also impaired, so that the final result when the spleen has been irradiated will probably be worse than at the outset, as atrophy of that organ will ensue and, as after splenectomy, the cessation of hæmolysis by the spleen will result in an increase of red cells. When the long bones have been irradiated regeneration soon continues the original activity. In three of the cases described irradiation had been carried out before the appearance of anæmia, in two cases (Minot and Buckman, D. G, and F.), two years before the appearance of anæmia, and in one case (Avery) five years before. Minot and Buckman's other two cases were irradiated over the spleen with radium after the onset of anæmia, and both seemed to benefit (? depression of hæmolysis). It is interesting to note that Parkes Weber[26] has described a case of myeloid leukæmia in which X radiation of the spleen, though causing a drop in the leucocyte count from 856,000 to 60,965, resulted in a rise of the erythrocyte count from 2,016,000 to 6,000,000, indicating the effect of depression of both leucocytopoiesis and hæmolysis. It therefore appears that irradiation is not the ætiological factor in this transition of polycythæmia to anæmia.

Summary.

1. A case is described in which polycythæmia rubra vera of several years' standing passed into an anæmia resembling pernicious anæmia. Liver treatment resulted in a marked improvement in the blood picture, but the patient died of an intercurrent polyserositis. Marked hæmopoiesis was seen in the bone-marrow. 2. The association of gout with erythræmia is noted, and has been previously described. It has even been propounded as a possible ætiological factor. 3. Blood destruction is shown by the presence of blood pigments in the blood serum, by the increased excretion of urobilin, and by the deposits of hæmosiderin. It has been demonstrated that the serum of erythræmic patients exerts a hæmolytic action on normal red corpuscles. 4. Diminished erythropoiesis was the cause of the anæmia in two cases, for an aplastic bone-marrow was found at autopsy; but both these cases were syphilitic, and aplasia may have been the result of antisyphilitic measures. 5. Excessive irradiation of the spleen is unlikely to be the cause of the anæmia, and may, in fact, increase the polycythæmia by diminishing hæmolysis. 6. The anæmia is probably the result of excessive hæmolysis, the over-balancing of a compensating mechanism, though there may also be a slight reduction of erythropoiesis (as compared with the height of the polycythæmia, but yet greater than normal), as is seen in animal experiments.

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References.

1. Guglielmo, G. di: Folia Med., 1917, iii., 386.
2. Blumenthal, E.: Bull. de l'acad. roy. de méd. de Belgique, 1905, 4 me. sér., xix., 775; and Jour. Méd. de Brux., 1905, x., 545.
3. Lutembacher, R.: L'Erythrémie, Paris, 1912, and L'Erythrémia, No. 67, Monographies Cliniques, Paris, 1914.
4. Chiron, M.: *Hæmatologica*, 1922, iii., 162.
5. Myers, B.: Proc. Roy. Soc. Med. (Clin. Sect.), 1923, xxi., 741.
6. Aubertin, C.: Arch. des Mal. du Cœur, 1913, vi., 103; Aubertin, C., and Mouguin: Nouveau Traité de Médicine (Roger, Widal, and Jeisser), Paris, 1927, Fasc. ix., 207.
7. Ghiron, M.: Hæmatologica, 1922, iii., 162.
8. Guglielmo, G. di: Kongresszentralbl. f. d. ges. inn. Med., 1920, xiii., 2.
9. Winter, K.: Med. Klin., 1908, ii., 1017.
10. Hirschfeld, H.: Polycythämie und Plethora Halle, 1912.
11. Rosin, H.: Therap. Rundschau, 1908, ii., 677.
12. Herzheimer, G.: Berl. klin. Woch., 1913, l., 1458.
13. Brieger, H., and Forschbach, J.: Klin. Woch., 1922, i., 845.
14. Minot, G. R., and Buckman, T. E.: Amer. Jour. Med. Sci., 1923, clxvi., 469.
15. Weber, F. P., and Bode, O. B.: Med. Press, 1927, cxxiv., 174.
16. Jung, K.: Quoted in 14.
17. Leube, W.: Sitzungsber. d. med. Gesellsch. Würzburg, 1900.
18. Pianese, G.: Hæmatologica, 1920, i., 61.
19. Guglielmo, G. di: Ibid., p. 303.
20. Minot, G. R.: Jour. Exper., Med., 1922, xxxvi., i.
21. Freund, H.: München. med. Woch., 1919, lxvi., 84.
22. Delhougne, F., Gotschlich, E., and Froboese, V.: Deut. Arch. Klin. Med., 1928, clx., 257.
23. MacCormac, H.: Proc. Roy. Soc. Med. (Derm. Sect.), 1914, vii., 118.

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FURTHER OBSERVATIONS ON THE ÆTIOLOGY OF PSITTACOSIS.

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In a previous communication[1] we reported that a filtrable virus had been isolated from a parrot which had died from psittacosis, and which during life had been responsible for two cases of this disease in man. In view of our inability to obtain bacteriological or serological evidence of infection with *B. aertrycke* or any of its allies in a considerable number of cases of psittacosis both in man and parrots, it was suggested that this filtrable virus was the ætiological agent of the disease. Since the publication of that paper our work has been carried considerably further and, though the investigation is still far from complete, results have been obtained which we consider to be of sufficient interest to place on record.

Investigation of Diseased Parrots.

Twelve parrots have now been investigated, but of these six only had been responsible for human psittacosis. Only three of these six parrots have been examined for the presence of a filtrable virus, and in all three evidence of such a virus has been obtained. *In each case the filtrate of an organ suspension has* produced a fatal disease in budgerigars, and one of these strains has now been carried to the third generation in budgerigars, filtered material being employed throughout. The filters used have been Chamberland L1* candles, and the Seitz E.K. filter, and in every instance the efficiency of the filters in arresting the passage of bacteria has been controlled. Control budgerigars inoculated with unfiltered suspensions of either parrot or budgerigar organs which had been heated to 100° C. for 20 minutes, have remained well. In none of these six parrots has any member of the salmonella group been isolated. The remaining six parrots, which were sent to us because they were ill but which had not been responsible for disease in man, have been submitted to a thorough bacteriological examination. In five of these birds no member of the salmonella group has been found, but from the remaining one *B. aertrycke* has been isolated. This parrot is of particular interest, for the post-mortem picture which it presented was so different from what had been observed in the other parrots, including the three from which we have obtained a filtrable virus, that even the most uninstructed and casual observer could not have failed to note the difference. During life there was nothing in the appearance or the symptoms of this bird which distinguished it from those suffering from psittacosis; further, in this particular bird *B. aertrycke* was isolated from the heart blood, liver, spleen, pericardial fluid, and intestinal contents with the greatest ease.

We feel that this observation is additional evidence that *B. aertrycke* is not the ætiological agent of psittacosis.

Investigation of Human Psittacosis.

We have inoculated budgerigars with material from eight human cases and in every instance have produced disease in these birds. The material employed has consisted of citrated blood (equal parts of blood and 2 per cent. citrate in saline) in six cases, blood serum in one, and pleural exudate in one. This material has not been filtered but has been tested culturally and with the exception of one blood (Mrs. X., see Table), which contained a few *Staphylococcus albus*, has been shown to be sterile. Control birds have been inoculated with normal human blood collected in citrate. The results of these experiments are given in Table I.

TABLE I.

Budg.	Material inoculated.	Period in illness when collected.	Size in c.cm. and route of inoculation.	Result. (d = day).
17.	C. bl. (Mrs. Y.).	Day. 7th.	1·0 i.p.	Ill 7th d., killed v. ill. 11th d.
18.	C. bl. (Mrs. X.).	8th.	1·0 i.p.	Ill 7th d. Died 10th d.
19.*	C. bl. Normal.	—	1·0 i.p.	In good health 16th d.
33.	Pleural exudate (A. B.).		0·5 i.p.	V. ill, killed 8th d.
34.	Serum (C. D.).	10th.	0·3 i.p.	V. ill, killed 6th d.
37.	C. bl. (E. F.).	4th.	0·5 i.m. 0·5 i.p.	V. ill. Still under obs. 8th d.
38.	"	"	"	Moribund 6th d., killed.
43.	C. bl. (G. H.).	"	0·5 i.m. 0·5 i.p.	V. ill. Still under obs. 5th d.
44.	C. bl. (I. J.)	"	0·5 i.m. 0·5 i.p.	Died 3rd d.
45.	C. bl. (Mrs. Z.).	11th.	0·5 i.m. 0·5 i.p.	Died 4th d.
47.*	C. bl. Normal.	—	0·5 i.m. 0·5 i.p.	In good health 6th d.

* Control. C. bl. = Citrated blood. i.p. = Intraperitoneal. i.m. = Intramuscular. obs. = Observation.

From budgerigars 18 and 34 we have been able to pass the disease with filtrates of a suspension of liver and intestine, thus carrying the investigation of these two human strains a stage further. The results of these experiments are given in Table II.

TABLE II.

Budg.	Material inoculated.	Size in c.cm. and route of inoculation.	Result.
39.	Filtrate of 10 per cent. liver suspension from budg. 34.	0·5 i.m.	Died 4th day.
40.		0·5 i.m.	Very ill 5th day.
41.	Filtrate of 10 per cent. liver and intestine suspension from budg. 18.	0·5 i.m.	Killed, moribund 3rd day.
42.		0·5 i.m.	Died 4th day.
46.*	Unfiltered suspension Budg. 34. Heated at 100° C. for 20 minutes.	0·5 i.m.	In good health 6th day.

* *Control.*

Epidemiological Data of Cases Under Investigation.

It is not proposed to enter into this question in any detail, for this will be dealt with fully at a later date by the clinicians responsible for the cases. In view, however, of the evidence which we have obtained of

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[1] THE LANCET, Feb. 1st, p. 235.

DR. AVERY: REFERENCES.

(Continued from previous page.)

24. Wynter, W. E.: Trans. Med. Soc. Lond., 1911, xxxiv., 444.
25. Walterdörfer: Berl. klin. Woch., 1914, ii., 663.
26. Weber, F. Parkes: Polycythæmia, Erythrocytosis and Erythræmia (Vaquez-Osler Disease), Lewis, London, 1921.
27. Buckman, T. E., and Horrall, O. H.: Trans. Amer. Soc. Clin. Investig., 1921, xv., 1.
28. Hess, R.: *Deut. Arch. klin. Med.*, 1909, xcv., 482.
29. Itami, S.: Folia Hæmatol., 1908, vi., 425.
30. Robertson, O. H.: Jour. Exper. Med., 1917, xxvi., 221.
31. *Kambe, H., and Komiya, E.: Amer. Jour. Physiol., 1920,* liii., 1.
32. Ottenberg, R., and Thalhimer, W.: Jour. Med. Research, 1915, xxxiii., 213.
33. Boycott, A. E., and Douglas, C. G.: Jour. Path. and Bact., 1908–09, xiii., 414; Ibid., 1909–10, xiv., 291.
34. Krumbhaar, E. B., and Chanutin, A.: Jour. Exper. Med., 1922, xxxv., 846.
35. Frank, E.: Schittenhelm's Krankheiten des Blutes, Berlin, 1925, ii., 411.

the presence of a filtrable virus in human cases of psittacosis, it might not be out of place to give some of the facts, particularly in reference to the two cases Mrs. X. and C. D. The former was one of five cases occurring in a house in Walworth-road, London. The parrot was brought on Dec. 11th, 1929, fell ill shortly after, and died on Dec. 22nd; it was destroyed. The patient denied any direct contact with the parrot, though she had been in the same room with it. She had, however, nursed another member of this group whose illness commenced on Dec. 21st, 1929. The patient, Mrs. X., fell ill on Jan. 12th, 1930, and was seen on Jan. 19th, when she was admitted to the London Hospital; she is now recovering. The specimen of blood was taken on this day—the 7th day of illness—when the disease was almost fully developed. C. D., aged 58, was one of four cases of psittacosis which developed in a house in Warwick. There were two parrots associated with this case, both of which died. One was dug up after burial, and sent to us for examination on Jan. 21st, and we have been able to kill budgerigars with the filtrate of a suspension of its organs. The patient was taken ill on Jan. 7th, 1930, and died in the Birmingham General Hospital on Jan. 18th. The blood from which we obtained the serum for inoculation of budgerigars was collected on Jan. 17th. We are indebted to Prof. G. Haswell Wilson and Dr. A. P. Thomson for material from this and one other case. In the latter of these two cases (C. D.) the disease appears to have been contracted from the parrot directly, but in the former (Mrs. X.) the evidence strongly suggests infection by contact with a human case. This is made all the more probable by the fact that the patient used a handkerchief in common with her sick relative whom she was nursing. There is one other case which calls for some mention, that of Mrs. Z., because it demonstrates the fact that parrot carriers exist, which, although in apparently good health, can communicate the disease to man. The parrot in this case was a grey one which was caught in Africa (Gold Coast). It was ill at the time, and was nursed by its captor and recovered after an illness lasting three months. Three months after recovery it was brought to this country and given to Mrs. Z., who has had it in her possession for eight months. Apart from transient attacks of diarrhœa it has been in good health. On Jan. 9th Mrs. Z. was bitten on the tongue by this bird, and she fell ill on Jan. 19th. She was seen by one of us on Jan. 30th, when the specimen of blood was taken with which budgerigars were infected (Table I.). This parrot is in our possession, and will be investigated.

Nature of the Virus.

At this stage of our investigation we are not in a position to say much about the nature of the virus which we have isolated. It appears to filter readily and to have a fair degree of resistance to glycerol. The strain isolated from the first parrot has been inoculated in hens (2), pigeons (2), and guinea-pigs (2). The guinea-pigs and pigeons have remained in good health, but the two hens sickened some nine days after inoculation, and are still very ill 20 days after infection. The possible relationship between this virus and the virus of fowl plague is still under investigation. Although we have no proof as yet that the parrot and human strains of virus we have isolated are the same, there can be little doubt that they are; the final proof of this will be a matter of future study.

In conclusion, we would again wish to express our indebtedness to our colleagues of the London Hospital and other doctors who have provided us with material for this investigation. In particular we especially wish to thank Dr. Robert Hutchison, Dr. R. A. Rowlands, and Dr. Donald Hunter of the London Hospital, and also Dr. W. J. C. Fenton of Barking, through whose energetic coöperation we have been able to investigate an outbreak of four cases in a family in Barking. We are grateful to the Yarrow Fund for a grant towards the expenses of this research.

Clinical and Laboratory Notes.

A NOTE ON
REMEDIAL EXERCISES IN THE TREATMENT OF PULMONARY DISEASES.

By A. H. Douthwaite, M.D., F.R.C.P. Lond.,
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AND
H. S. Angove,
SISTER IN CHARGE OF MASSAGE DEPARTMENT.

The high incidence of pulmonary complications in recent epidemics of influenza has prompted this brief account of the methods and results of physical treatment as applied to the common diseases of the lungs and pleura. The advances made in the surgery of the chest, lately reviewed by R. A. Young[1] in his Lumleian lectures, make a wider knowledge of the importance of after-treatment essential. For purposes of description, the types of case suitable for physical therapy may be divided into three groups:—

1. Those in which the expiratory function is in need of assistance—e.g., emphysema, asthma, bronchiectasis.
2. Those in which aid to inspiration is desirable—e.g., empyema, pulmonary collapse.
3. Those in which both inspiration and expiration are interfered with—e.g., chronic bronchitis, pneumonias with delayed resolution.

In certain pulmonary diseases, particularly those of chronic nature, the muscles of the chest wall assume a new postural length and tone, adapted to the changed contour of the thorax. This alteration tends to establish itself as a permanent condition and inevitably leads to rigidity of the parietes and seriously interferes with curative efforts. It will be seen, then, that a mobile thorax must be attained before passing on to those exercises and manipulations whose object it is to affect the deeper structures. Furthermore, it is usually desirable to apply massage to the limbs in order to aid the circulation and prepare the body for the introduction of active work.

All the respiratory exercises produce a beneficial effect on the condition of the thoracic joints and muscles, yet certain schemes are directed primarily toward this end. These consist of encouragement of the movements of flexion, extension, and rotation of the spine, at first carried out singly and later in combination.

Treatment of Thoracic Contents.

1. *Chest Clapping.*—A series of short quick strokes on the chest wall has been found to assist in loosening tenacious mucus, probably indirectly by the sudden multiple expulsions of small volumes of entrapped air.

2. *Chest Shaking* is carried out during expiration only, the hands being placed on the chest and given a rapid in-and-out shaking movement. An effective assistance to expiration is thus obtained.

3. *Vibration* is merely a modification of 2, in that the movements are finer and less vigorous.

4. *Controlled and Localised Breathing.*—Patients are first taught to produce the thoracic or abdominal type of respiration at will. When this can be rendered efficiently, they pass on, if indicated, to exercises in which a part of the chest is fixed in order to promote more efficient expansion in the diseased area of lung. The patient's arm is placed firmly against the normal side, the forearm passing across the abdomen, and the hand grasping the iliac crest of the opposite side. This attitude limits the movement of the diaphragm on the healthy side, and the gymnast completes the fixation by placing her hands on the

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[1] The Lancet, 1929, i., 805.

front and back of the chest. Respiration is then carried out at first quietly, then with deep inspiration, the effect of which can be fortified by holding the breath; at this stage the arms may be extended above the head. The latter exercise is of special value in aiding expansion of collapsed lung, and more effective than the old method of blowing water from bottle to bottle, an exercise which is apt to produce a strained attitude with fixation of the thorax. Yet more pronounced effects may be obtained by changing the position of the chest. Thus bending laterally will open out the intercostal spaces on the opposite side and so aid expansion. This can be accentuated by fully extending the arm on the side of the convexity.

5. *Alteration of Posture.*—If it is desired to empty pus-containing cavities, the chest is tilted downwards, the legs lying across the couch, the hands resting on the floor. This position must, however, be carefully supervised, and not undertaken without a careful review of the general condition. It may be advantageously combined with shaking and vibration.

Precautions during Treatment.

In diseases of the lungs in which there is no open wound, or in which a suspicion of tuberculosis is entertained, pulse-rate and temperature are used as guides to the extent of each individual treatment. If there is no independent disease of the myocardium, it is safe to raise the pulse-rate 20 to 30 beats in older people, and 30 to 40 in the young, at each treatment, provided that it returns to normal within three minutes after cessation of exercise. Work of this degree produces sufficient acceleration of respiration to attain the desired result. If, on the other hand, the pulse-rate shows from day to day a persistent rise, exercise must be stopped or reduced. If the temperature is above normal in the morning, treatment for that day should be omitted; if it persists, treatment should cease. In pleural effusion persistent pyrexia is a contra-indication to exercise. Should there be an open wound, as in empyema, pyrexia often denotes faulty drainage. It may then subside if the movements of the chest be increased in extent. If after two or three days the fever persists, however, exercises must cease pending further surgical treatment.

General Scheme of Treatment.

A general scheme of treatment would include: (1) active movements of arm or leg to increase respiratory excursions; (2) bilateral free breathing; (3) active movements, arm or leg plus postural training; (4) localised breathing (controlled); (5) movements of the trunk; (6) localised breathing (controlled); (7) repeat (3); (8) repeat (6); (9) repeat (3); (10) bilateral free breathing.

Two sets of active movements only need be used, and in the early stages movements for the trunk may be omitted. The training of posture from the very beginning is important; the arm-chair bed and the head pushed forward on the chest are both to be avoided from the first. The scheme is made more vigorous by (*a*) changing posture, from lying to sitting and finally standing, (*b*) increasing the number of times each exercise is performed. Each movement usually begins six times and is increased one, two, or three times a day, until it produces the desired effect; (*c*) adding a resistance to the movement such as lifting a pound weight in each hand; (*d*) increasing the rate and duration over a given time for each exercise.

Differential Treatment of the Three Groups.

Group I.—A. F. Hurst,[2] writing on the value of remedial exercises in asthma and emphysema, stresses the importance of recognising and correcting the postural errors which develop and tend to persist in these diseases.

With this aim in view, treatment is initiated with exercises to restore to normal the position of the shoulder girdles, thoracic walls, and abdominal musculature, and at the same time to increase the range of mobility of the spine and costal articulations. Breathing exercises are taught next, particularly with a view to encouraging expiration. Each consists of three and a half respiratory cycles, and commences with forced expiration. There are, therefore, four deliberate expiratory to three inspiratory movements. Air is drawn in through the nose and expired through the mouth, the tongue and teeth being in the position for sounding the letter S. The end of each voluntary expiration is assisted further by the patient, whose efforts are reinforced by the masseuse, applying "thoracic shaking" to different areas, the hands being placed first on the antero-lateral aspect of the chest, then in the mid-axillary line, the apices, and finally the posterior wall of the thorax. In the last position the patient bends backwards over the assisting hands during expiration in order to promote correction of the acquired kyphosis.

These respiratory gymnastics should be carried out sometimes with the thoracic, sometimes with the abdominal, and at times with the combined type of respiration, all of which have to be explained and taught to the patient if success is to be achieved. It will be observed that the object of the above treatment, both in asthma and in emphysema, is to reduce the bulk of the lungs and increase the power of the expiratory muscles. In the former disease, much of the apparent emphysema is due to simple over-distension, which is amenable to physical treatment. In the latter affliction, although the emphysematous areas must remain as such, yet large areas of the lung are in a pre-emphysematous stage—i.e., over-distension without atrophy of lung tissue, and if this be corrected, the destructive process will be materially retarded. Furthermore, improvement in the respiratory excursions in both cases must act beneficially on the pulmonary circulation and consequently upon the heart muscle and systemic system.

The same treatment is given in cases of bronchiectasis, but, in addition, the patient is tilted trunk downwards, and vigorous chest shaking performed during expiration. Large quantities of foul sputum are thus evacuated with frequently dramatic improvement in the general condition.

Group II.—Empyema forms the most important member of this group, and its management alone will *therefore be considered in detail.* There are few conditions in which early attention to physical treatment is of such paramount importance. For several years it has been our practice to start exercises within 24 hours of the operation in order to (1) promote expansion of the lung and, therefore, adequate and complete drainage of the empyema cavity; (2) prevent scoliosis. That absorption of toxins is accelerated by early exercises is not borne out by our experience, in fact, the reverse seems to be the case. On the other hand, secondary operations necessitated by pocketing of pus, or persistence of an infected sinus, become progressively rarer the earlier the exercises are undertaken. When instituted almost immediately after operation, healing takes place in two or three weeks with almost perfect expansion. During the first 48 hours treatment the dressings remain undisturbed, and no active limb work is given. The pulse is taken before and after exercise. Some degree of pyrexia is, of course, present during the first few days, but forms no contra-indication to treatment. After the first two days the tube is removed and the wound covered with a dressing before the exercises are carried out. Thereafter the tube is replaced and the wound dressed afresh.

The first scheme consists of: (1) deep breathing, insistent instructions being given to encourage the taking of deeper breaths; (2) readjustment of position—e.g., a pillow to throw the chest slightly forward, thus bringing the neck into line with the trunk; (3) kneading to the arms; (4) deep breathing. This is repeated the next day, and from the end of the second treatment active work is added, care being taken to restrict movement on the normal side.

The following progression of exercise is made. *Arm:* Double arm bending and stretching—i.e., flexing and extending the arms from the side to above the head. Begin six times and progress daily, until the movement is performed 36 times a minute for three minutes. The patient may hold a weight of one or two pounds in the hands if more exercise is required. *Leg:* Alternate, and later double leg bending and stretching. Beginning six times and increasing daily as for the arm. *Trunk:* No movements are given during the first week of exercise. Later, trunk movements are introduced.

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[2] Guy's Hospital Reports, January, 1927.

After each set of active movements localised breathing is carried out. This must be (*a*) with the normal chest fixed; (*b*) with the arm of the affected side gradually raised above the head; (*c*) with the trunk bent to the opposite side. These breathing exercises are usually taken from the following position. Half lying: the usual position for an empyema to be nursed. Lying, and lying with the trunk bent to the opposite side. Sitting, and sitting with lateral bending. Standing, similarly combined with bending to the side. Each breath is held for a moment at the end of full inspiration. Shaking and clapping should be avoided whilst there is an open wound. When the patient is allowed to get up, walking, running, and skipping are gradually introduced as immediate precursors of the breathing exercises.

Pyrexia does not necessitate discontinuing treatment, provided that the wound remain open, unless the raised temperature persists for longer than three days. A persistent rise in pulse-rate frequently denotes that too much exercise is being given.

Group III.—The danger of fibrosis of the lung and bronchiectasis as sequelæ to broncho-pneumonia has long been recognised, and a large number of influenzal pneumonias, although of lobar type, present persistent signs of massive consolidation for weeks after the pyrexia has subsided. In others the greater part of the affected lobes pass through the normal resolution, leaving a basal patch of dullness, bronchial breathing, and coarse râles which fail to clear up in spite of complete subsidence of constitutional disturbance. The value of remedial exercises for these conditions lies largely in the induced increased respiratory excursions which act as a stimulus to the pulmonary circulation in the affected areas. The increased blood flow enhances the process of cleansing of the site of the inflammatory products, thus effectively forestalling the changes of organisation. In influenzal pneumonia it is well to delay treatment until the temperature has been normal for a week. In broncho-pneumonia a low but persistent grade of pyrexia may follow the acute stage. If this be the case, exercises can be cautiously instituted, and not infrequently result in a fall of temperature to normal.

The actual procedure is the same as that outlined in the case of empyema, and should continue until resolution is complete. Daily instruction must be given until the patient is well grounded in the exercises, which should be carried out thrice daily. After this, weekly supervision is probably all that will be required. Chest shaking, clapping, and vibration are also indicated in cases of slowly resolving broncho-pneumonia.

Failure to achieve success when dealing with this group is unusual, and then referable to undue delay between the termination of the acute illness and the initiation of the physical therapy which we have described.

A CASE OF
CARDIAC HYPERTROPHY IN AN INFANT.

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A MALE child, aged five weeks, was brought recently to the North Devon Infirmary, Barnstaple, in a state of great weakness and with marked cyanosis. The lips were a bright purple, the face had a distinct bluish tinge, the fingers were clubbed, and the hands were dusky.

The child had been breast-fed, but was so feeble that it had never been known to cry; its only efforts in that direction were confined to a few abortive gasps, accompanied by a distortion of mouth and facial muscles. It was fairly well nourished, and weighed on admission 7 lb. 8 oz., as contrasted with 7 lb., its weight at birth.

On examination the most marked manifestation was the terrific effort made in inspiration. The whole chest heaved and seemed to lift itself bodily from a globular abdomen. The sides of the ribs were indrawn, as also the axillary spaces, and the intercostal muscles were definitely retracted into troughs and hollows along the chest wall—a condition which, except for the absence of stertor, was highly suggestive of diphtheritic tracheitis.

On percussion a pronounced dullness was remarked over the cardiac area and extending well to the right of the sternum, but no thrill nor præcordial pulsation could be felt, nor was any murmur heard. Bearing in mind the condition of pulmonary atelectasis, I was surprised to note that the lungs posteriorly were clear and resonant to percussion, and that the breath sounds were characteristic of normal infantile vesicular breathing.

No radiogram was taken, and the child died suddenly 24 hours after admission.

Post-mortem examination.—On removal of the chest wall the heart presented an unique spectacle. It occupied four-fifths of the whole thoracic cavity. The lungs were nowhere to be seen anteriorly, and the cardiac mass suggested nothing so much as an overgrown liver that had been thrust bodily upwards through its diaphragmatic roof. The weight of the heart was 4½ oz., and its size was 2¼ in. by 2½ in. It resembled a huge duck's egg, being five or six times the size of the infant's fist, which is generally considered a fairly reliable index of normal cardiac measurement.

On removing the pericardium the hypertrophy of the right side was at once brought to view—the walls of the right ventricle being twice as massive as those of the left; indeed, in their upper part they were over half an inch thick. The pulmonary artery was widely opened, having a calibre in cross section of an ordinary lead pencil. There was no trace of a permanent ductus arteriosus. The ventricles were healthy, as also was the interventricular septum, and the only lesion discovered was a small obliquely vertical aperture, 5 mm. by 2 mm., in the fore part of the membranous diaphragm of the fossa ovalis. That so small an aperture could be responsible for such cardiac hypertrophy, and so pronounced a cyanosis, appears remarkable, but the conclusion seems inevitable.

During the child's short stay in hospital its condition was only partially relieved by oxygen. The general respiratory enfeeblement and the absence of crying completed the picture of a child being slowly asphyxiated by tardy and imperfect oxygenation due to a primitive hiatal defect in the pulmonary system. The enforced limitation of a normal respiratory excursion was brought about by the presence of a tumour-like mass—the self-destroying cardiac hypertrophy—Nature's too prolific response to the call of a heavily burdened infantile heart.

I am indebted to Dr. S. R. Gibbs, hon. physician to the hospital, for permission to make these notes.

A NOTE ON THE
RELATIVE SEPTICITY OF THE DUMMY TEAT AND THE THUMB.

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THE first instinct in life, and the first desire of an infant is to suck something, preferably the maternal nipple; but when this pleasure is denied, consolation is obtained from the nearest available substitute. Very young infants do not suck their thumb; this habit is acquired toward the middle of the first year as soon as the way to the mouth has been discovered by the hand; and the fact that a dummy teat has never been offered to the infant does not prevent the child from thumb-sucking later. The ideal infant would not attempt to suck either the dummy or the thumb, but however one may advise, there are mothers who will give a dummy for the sake of peace especially amongst the very poor where a whole family occupy a single room, and are compelled by circumstances or a tired husband to quiet a noisy infant. Nor can one seriously blame them, for the use of the dummy is far less baneful than to allow the child to suck its thumb. The dummy made of smooth composite rubber and not perforated—as is the bottle teat—allows no air to be sucked through it, and I have yet to find an infant seriously upset by anything that could honestly be ascribed to the dummy. Of course, if the mother moistens the dummy with her mouth before inserting it into that of the child, therein lies a certain risk of infection from anything from which the mother may suffer; but otherwise there can be but little more harm in sucking a smooth dummy than that attached to the bottle from which he sucks for a considerable time daily. I am sure that there is a tendency to magnify the evils of a dummy, though the evils of thumb-sucking can hardly be exaggerated.

The thumb has a comparatively rough surface, is rarely cleansed, and is used prehensilely with every grasp of the hand, so that the surface becomes excessively foul. I have lately had the great advantage of the assistance of Dr. F. H. Teale and his staff in making some observations on the comparative septicity of the dummy and the thumb, and in ascertaining approximately which of the two is the greater source of possible infection.

Technique.

A sterile swab was dipped into a tube of 10 c.cm. of culture medium, and wiped three times against the side of the tube to remove excess of medium. The dummy, or the thumb, was then wiped six times in different directions in its long axis. The swab was then immersed in the culture medium and stirred for five seconds. Graded quantities of this emulsion were immediately plated out and after 24 hours' incubation the colonies were counted, averaged, and the results expressed as numbers of colonies per c.cm.

Results.

Case.	*Dummies.* Colonies.	*Thumbs.* Colonies.	Case.	*Dummies.* Colonies.	*Thumbs.* Colonies.
1	26	300	7	420	5000
2	115	Innum.	8	112	322
3	1560	1240	9	1920	446
4	716	Innum.	10	900	580
5	1000	3500			
6	166	Innum.		6935	11,388

Innum. = Innumerable, and signifies colonies of over 20,000 in number.

If we take "innumerable" at 20,000, the comparative figures are for the dummy 6935 colonies, whereas the number of colonies for the thumb amount to 71,388 or over ten times that of the dummy. The thumb therefore is ten times more septic than the dummy.

Remarks.

Apart from the effect of constantly sucking the foul thumb, there is another side which demands consideration. The thumb is a hard body, and if frequently in the mouth tends to pull forward the growing pre-maxilla together with their incisor teeth, so that the upper incisors project forward often beyond the upper lip, giving the "dents des Anglaises" appearance which the French so love to caricature. When the child has cut its second dentition the dentist then reaps his harvest of extractions and plates with wired tensions to press into place the prominent incisors. Another result of the thumb-sucking lies in the fact that the thumb having a joint, the ball of the thumb is flexed in the mouth and the palate is thus pressed up into a high arch at the expense of the nasal floor, thus lessening the lumen available for breathing through the nasal passages, with consequent congestion and all the associated evil results.

BRISTOL EYE HOSPITAL.—Last year this hospital treated 550 in-patients and 13,683 out-patients, and it is no longer possible to cope with the demands upon accommodation. A new building, to cost £50,000, is therefore to be erected, containing a children's ward, two wards for infectious cases, wards for paying patients, more accommodation for the staff, and a larger out-patients' department.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF SURGERY.

A MEETING of this Section on Feb. 5th, with Sir HOLBURT WARING, the President, in the chair, was devoted to a discussion on

INTRATHORACIC TUMOURS.

Mr. A. TUDOR EDWARDS referred to the question whether the recent increase in the reported cases of primary malignant disease in the thorax was due to a real increase in incidence or to better methods of recognition. A similar increase in benign growths in this region suggested that the second explanation was the right one. Tumours of the thorax were divisible into mediastinal, pulmonary, pleural, according to their origin. Mediastinal tumours comprised benign tumours, such as goitres, dermoids, and teratomata and also aneurysms—a variety responsible for a good deal of difficulty in diagnosis. The primary malignant tumours were sarcoma, carcinoma of the thymus, and lymphadenoma. Secondary carcinoma in mediastinal glands arose from carcinoma of the bronchus, lung, or pleura, and also from primary carcinoma of the breast. Of the benign mediastinal tumours, intrathoracic goitres tended to remain localised in the superior mediastinum, and so behaved like benign growths in that region. Dermoids and teratomata, on the other hand, enlarged laterally. The chief early symptom of goitre was dyspnœa, but enlargement of the tumour results in venous obstruction, as shown by cyanosis of the skin of head and neck. Pressure on nerves seemed to be rare. The physical signs of these goitres, apart from toxic manifestations, were an area of dullness on percussion over the sternum and enlargement of veins in the same area. X rays showed a well-defined opacity in the upper substernal area; oblique views showed the tumour to be situated anteriorly. It might not be possible to diagnose this from dermoid. He did not think that mediastinal dermoids and teratomata often caused symptoms because of their position; but when they extended outwards there might be symptoms due to irritation or there might be rupture into a bronchus, the former being manifest by non-productive cough. When infection took place the signs were those of pulmonary abscess. In some cases pressure of the tumour on the lower lobe caused bronchiectasis. Unless infection supervened X rays clearly outlined the tumour, and when bone or teeth were present they gave a denser shadow. Induction of artificial pneumothorax would often make a distinction possible from intrapleural tumours.

Intrathoracic goitres, said Mr. Edwards, should be removed as soon as respiration was embarrassed; for the larger tumours it was necessary to split the sternum in the mid-line down to the third interspace. Dermoids and teratomata, when localised to the mediastimun, could be approached by the same route, but he preferred exposure through the pleura. In a general way it could be said that the large tumours should be exposed by a posterior incision, the smaller ones by the anterior route. After removal of the tumour the chest was made air-tight by approximating the muscle layers; he had not found that percostal or pericostal sutures were needed. He had operated upon seven cases of true intrathoracic goitre, and three required division of the sternum. Shortness of breath was a complaint in all, and two had been treated as asthma for three and four years. One post-operative death occurred among the seven; this patient had toxic goitre, and the thymus was found to be enlarged. There was also one death among seven cases of operation for teratomata or dermoids, the tumour in this case being of the size of a fœtal head. Mr. Edwards had also operated upon one cyst which contained 1½ pints of fluid, and the patient recovered and was still well four years later. With malignant mediastinal tumours operation was rarely possible, and more rarely still was there freedom from recurrence for any considerable time. Recurrent sarcomata seemed to be insensitive to X rays in treatment.

Benign pulmonary tumours were very rare. The most common cysts in the lung were hydatid, and might be single or multiple. They gave rise to cough and expectoration, and sometimes—when near the lung surface—to pain. Of malignant growths of the pulmonary region primary carcinoma might arise in the bronchi or in the alveoli, the former being the more common; it usually arose towards the hilum. Sarcoma here was much rarer than carcinoma. The types of sarcoma were the spindle-celled and the peribronchial infiltrating forms. In bronchial carcinoma dyspnœa seemed to be the earliest and outstanding symptom, and hæmoptysis might be the first event; in many cases the fever suggested influenza. The physical signs, in most, were those of atelectasis of the lobe which communicated with the affected bronchus. Lipiodol might confirm the diagnosis, for it showed an irregular blocking of the bronchus involved. Bronchoscopy would also reveal the condition. When secondary glands were present in the neck they should be removed under local anæsthesia and histologically examined. All types of malignant disease in the lung might have pleural effusion as a late sequel.

Only rarely, said Mr. Edwards, did bronchial carcinoma allow of radical operative removal—largely because of the early involvement of mediastinal glands. He had not yet seen even improvement in such cases as a result of deep X ray therapy, and various doses of radium as a surface application had, in his hands, been disappointing. Better effects, however, followed the use of radon seeds. These should be used only after full exposure of the tumour. Central carcinoma and endothelioma were much more favourable for operation. In secondary malignant deposits in the lung no form of treatment seemed to be of value, but partial pneumectomy was carried out in one case of secondary myeloma, the primary disease having been in the fibula, and the patient was still well two and a half years later. Most tumours characterised as pleural probably arose in adjacent structures and developed inwards. Benign tumours here should be removed surgically as soon as diagnosed if the general state permitted; otherwise life would be ended owing to pressure on important structures in the course of growth. The malignant tumours found in connexion with the pleura were endothelioma and sarcoma, and these caused localised thoracic pain, with pleural effusion, serous first and hæmorrhagic later. The localised type could be removed if diagnosed before secondary deposits were evident. Radium should be applied in sarcomatosis.

Discussion.

Mr. W. H. C. **ROMANIS** said that in some cases a large mass of thyroid tissue down in the chest had no visible connexion with whatever thyroid tissue might be present in the neck. When a rounded shadow appeared in the radiogram below the sternal notch this condition should be suspected. These retro-sternal goitres might be easy to remove or very difficult. He had only once found it necessary to split the sternum; sometimes they could be pulled out. Dermoids gave rise to a variety of manifestations, but pressure on important structures was not common with them, though in one case he had seen gross interference with the action of the heart. The best approach for removal was from the side, making a large incision between two ribs. Hydatids were so rare in this country that no surgeon or physician saw many of them. With regard to malignant disease of lung, the percentage of operable growths encountered by any surgeon was at present very small. The only means of making the proportion larger seemed to be early exploration of all doubtful cases. Radium treatment for these cases was at present in its infancy. He was not altogether a radium enthusiast, but he had tried radon seeds in some cases of growth of the lung, and they seemed to benefit some growths there, just as they benefited some growths of breast and tongue. He had one case at present which was a surgical failure but a radium success, and he thought there were likely to be a fair number of successes with radon seeds in pulmonary growths. Before exploratory thoracotomy and before removing most of these tumours it was essential to produce artificial pneumothorax. This should be done a day or two earlier.

Dr. L. S. T. **BURRELL** said that most of his patients who proved to have tumour of the chest came with the complaint of dyspnœa and were found to have pleural effusion; this was especially true of tumours of the pleura. The second great group of symptoms were those of pressure on a bronchus, the onset of which might be quite sudden. More than one of these cases had been diagnosed as pneumonia. Another initial symptom was hæmoptysis. Often he heard the remark "I don't think he can have malignant disease, for he has very few constitutional symptoms, and looks so well." But this was just the reason for suspecting malignancy. In most cases radiography would show a tumour, but more commonly it would show pulmonary collapse which it had caused. When effusion developed in cases of tumour it was, as a rule, blood-stained. A more frequent sign was an excess of endothelial cells. He regarded the use of lipiodol for diagnosis as very important. He agreed with Mr. Romanis on the induction of preliminary artificial pneumothorax; this enabled a thoracoscope to be used with the idea of seeing the tumour. Some cases which were thought to be lymphosarcoma of lung were in reality carcinoma, starting usually in a bronchus. Metastases were found in the liver in 40 per cent., the bones in 12 per cent., and the spleen in 10 per cent. In his view, there was only one treatment for the growths under discussion—namely, surgical operation. In every case he had seen which was treated by radium and deep X rays there had been recurrence. Radium seemed to be useless in intra-thoracic growth. He described five recent cases of his own.

Dr. F. G. **CHANDLER** showed and described a number of radiograms of cases of malignant thoracic tumour which had come under his care. Paralysis of the phrenic nerve, or of the recurrent laryngeal, must always be regarded as suggestive of growth; the suspicion was helped by the presence of secondary glands. An axiom he submitted was that it was better, in a doubtful case, to operate on a case of hopeless growth than neglect a case of abscess. Nor should it be forgotten that a mass evident to X rays might be gummatous. At present no form of treatment for these cases held any assured promise. Of 120 cases of primary malignant intrathoracic tumour, half of them treated by X rays and half by radium, only four were now alive.

Mr. W. A. **WHITE** said the commonest malignant growths of the chest were carcinomata, and many of them were inoperable. The commonest accompaniment was a dry unproductive cough, associated sometimes with severe convulsions and cyanosis. For the application of radium he used a small trocar and cannula of his own devising whereby he applied a radon seed fixed by paraffin wax to a stilette. On connexion with an electric current the wax was melted; the heat coagulated the tissues, the stilette was withdrawn, and the radon remained in situ. He showed a patient, well and strong, from whom he had removed a carcinoma which was growing into the mediastinum.

Mr. **JAMES MAXWELL** gave the results of the examination of 184 cases of primary bronchial carcinoma collected at St. Bartholomew's Hospital and the Royal Chest Hospital. He classified them according to site and method of spread. Six per cent. started in the roots of the lung and the surrounding bronchus alone; that type was not prone to cause early metastasis, and some success attended treatment. In 20 per cent. the growth infiltrated a lobe of the lung alone, and this was fairly easily amenable to radium or X rays. *In 25 per cent.* the mediastinum was infiltrated, not the lung. The bronchus and pericardium were early involved, and implication of aorta and important structures followed. It was always outside the scope of surgery, though it might be treatable with radium. In the fourth type both lung and mediastinum were infiltrated, and these were most difficult to treat. This was the most numerous type. It must be remembered that many people with malignant disease of the thorax also had tubercle bacilli in their sputum.

Mr. J. E. H. Roberts agreed with those who had a poor opinion of the result of deep X ray treatment of these carcinomatous tumours; he had not seen permanent benefit from it. Still its use would probably continue, for it was difficult to see the likelihood of cases being brought to the surgeon at an earlier stage. He had, however, seen several cases in which primary sarcoma had disappeared after the insertion of radium, and though patients died some two years later from metastases elsewhere, the primary growth, to the date of the death, had not recurred. It was very important to gain all possible information about the behaviour of the tissues of the lung in the presence of irradiation from X rays and radium.

SECTION OF OTOLOGY.

At a meeting of this Section held on Feb. 8th the chair was taken by Mr. W. M. Mollison, the President, and Prof. Heinrich Neumann, of Vienna, opened a discussion on

Brain Abscess.

He first commented on the astonishing fact that Macewen's statistics of 50 years ago were better than even the best figures recorded since. Macewen had selected his material, but even with selected cases Prof. Neumann could only get 47 per cent. of good results. Possibly Macewen's success had been partly due to his custom of postponing operation until protective adhesions had been stimulated in the dura by 20 per cent. carbolic acid, and to the fact that he had opened cerebellar abscesses without waiting for the characteristic symptoms which had been described by more recent workers.

(Prof. Neumann then showed and described a very large number of slides and specimens from his practice).

The shape of the abscess did not appear to be influenced by the presence or absence of a capsule, or by its origin from acute or chronic otitis. The *direction of growth and the position probably depended* upon the blood-vessels and the structure of the nerve-fibres. In spite of the uniformity of the pathological and anatomical picture, the clinical manifestations varied considerably, and seemed to be much influenced by the situation of the abscess. It was remarkable that abscesses were quite often diagnosed and sought by puncture, and yet no pus was found. Whether this was due to a thick capsule or to the consistency of the contents was not known, but puncture more often gave a negative result in cases of abscess following acute otitis than in those following chronic otitis. Failure to find pus in cerebellar abscesses was explained by the fact that the abscess cavity was flat or slit-shaped, so that the needle could easily miss it or pass right through it without yielding pus. The characteristic focal symptoms of both cerebral and cerebellar abscess appeared relatively late, and it was therefore wise to perform exploratory puncture as soon as the general state roused any suspicion of abscess. Despite the rarity of cerebellar abscess and the fact that its general symptoms could be produced by other conditions, it had been found worth while to pay great attention to the general symptoms, such as repeated vomiting, dizziness, and constant occipital headache. For the production of focal symptoms decomposition in the abscess as well as changes around it were important. Cerebellar abscess affected the white matter very late, and tended first to spread between the grey and the white matter. Specific symptoms only appeared when fibre-systems were encroached upon. Some patients might have been saved if they had been diagnosed and operated upon before these focal symptoms appeared. Hitherto, however, the dangers of puncture, especially of the posterior fossa, had discouraged workers from exploring in the stage of general symptoms. On the whole it was best not to incise the dura before puncture, on account of the risk of prolapse and of alteration in the circulation and tension of the cerebrospinal fluid.

Treatment must vary with every case; each abscess needed its own special method of operation. No kind of drainage was of any use for deep abscesses covered with a thick layer of encephalitic brain; only removal and tamponing of the abscess could relieve it. Abscesses near the surface could be healed by drainage with filiform tubes or stretching with brain forceps. Every operator naturally preferred his own method. Prof. Neumann had not had good results from his trial of Lemaître's filiform drains, which he had found insufficient. The temporary healing of an abscess must not be looked upon as final. There was insufficient material in the brain tissue for healing a large defect, and one part of the abscess cavity might heal as a solid mass while another part formed a cyst, which sooner or later—often years later—could be reinfected by an acute exacerbation which must be regarded as a relapse. Operation must be performed in such a way that the patient was not left a cripple, but on the other hand brain abscess was such a dangerous condition that the life of the patient must not be sacrificed by operating too timidly.

Diagnosis of Brain Abscess.

Mr. H. W. B. Cairns said that bad results in brain abscess were almost entirely due to faulty diagnosis. He would like to raise one point of operative technique. Success depended in the first instance upon the power of the brain to localise the infection. Whereas Macewen had used burrs for opening the mastoid, modern otologists used mallet and chisel. He wondered whether this was a factor in the results; whether perhaps the resistance of the abscess wall was partially broken down. On the whole the results were rather better in cases where the abscess did not arise from the ear.

Many unexplored cerebral cases went to post-mortem direct from the medical wards, but admittedly many of them only arrived at hospital when their condition was very bad. The blame for giving the benefit of surgical exploration to so few of these patients must be assigned to all branches of the profession. Symptomatically the cases were not yet clearly defined. The localising signs had been well established, but it was not so easy to remember the possibility of brain abscess in a patient who had relapsed into stupor after a short period of vomiting and headache. Cases were often diagnosed as encephalitis or cerebral thrombosis. Some mistakes were due to a neglect of ophthalmology and perimetry, but many cases showed little or no papillœdema. In most cases the temperature was subnormal. Brain abscess was often missed if it began during convalescence from some other illness. After a mastoidectomy, or even a mild attack of mastoiditis or frontal sinusitis, a patient might show some disturbance of convalescence, but as he was in bed under the best conditions for fighting infection a cerebral abscess might form, be well localised, and remain unsuspected. After apparent complete recovery and return to work he would be suddenly taken ill and die. All such cases of disturbed convalescence should be observed very closely over a long period. The onset of an abscess might be heralded by a Jacksonian fit, but was more often indefinite, especially if it arose from a neighbouring focus of infection. The localising signs had been well described; the difficulty was to elicit them. Repeated daily perimetry gave most valuable information, and it was possible to get charts from acutely ill patients if the right moment of intermission of symptoms were seized. The appearance of an homonymous quadratic defect clinched the diagnosis, and showed the level and progress of the abscess. The onset of a complete homonymous defect indicated immediate operation. Another useful diagnostic aid was X rays; abscesses often contained gas. The differential diagnosis from encephalitis, cerebral thrombosis, cerebral aneurysm, tuberculous meningitis, purulent pachymeningitis, purulent leptomeningitis, and serous meningitis could only be made at present by exploratory puncture. There was no risk of infection if the mastoid wound was sealed off with sheet gutta-percha. If pus was found directly the dura was nicked, if there was a large amount of subarachnoid cerebro-spinal fluid, or if a few drops of fluid were obtained from the lateral ventricle, then there was probably no abscess present. There was always considerable œdema round an abscess, and the ventricle was obliterated. Œdematous brain-tissue brought out by the needle could be distinguished from normal tissue; it was glistening, very soft, and yellowish-white. Purulent pachymeningitis might follow mastoiditis and cause signs and symptoms identical with those of abscess. Even at operation it might be overlooked, as the pus sank to the lowest part of the brain; the head, therefore, should be tilted when the dura was opened. Cerebral abscess might be confused with what was called by some serous meningitis and by others arachnoiditis, although neither term seemed a good one for a condition of hydrocephalus with some defect of absorption and possibly excessive production of cerebro-spinal fluid. It came on after acute or chronic mastoiditis, and there might be no demonstrable focus of infection. There was great risk of blindness, and a decompression should always be performed to save vision. Diagnosis must be carried out during treatment and the operation must take place in stages, as additional symptoms often arose after the first interference. Many problems depended on the accurate day-by-day observation of the patient.

Review of Cases.

Mr. J. S. **Fraser** gave an account of the 17 cases of temporal lobe abscess on which he had operated; six had recovered and 11 had died. Ten of them had been males and seven females, and most of them had been under 30 years of age. Nine of the abscesses had been on the right and eight on the left; only three of them had followed acute otitis media. The labyrinth had been functioning in 13 and not in two. The temperature had been subnormal in seven, normal in two, and raised in eight. The pulse-rate had been slow in five, normal in four, and rapid in eight. Ten had been drowsy or comatose on admission, and in four of these there had been attacks of delirium. The pupil on the affected side had been dilated in three cases and there had been sensory aphasia in four. Of the eight cases investigated by the ophthalmoscope, two had shown double optic neuritis. Six had had meningitis on admission, and five of these had died; six had developed meningitis after operation, and all of these had died; five had had no meningitis, and had recovered.

Pathology of Brain Abscess.

Mr. E. **Miles Atkinson** said that the essential point at issue was the route by which the infection travelled, and this depended on the anatomy of the cerebral vessels. Those descending from the cortex and those ascending from the base left between them a layer of white matter, just below the cortex, which was poorly supplied with blood. In this area the abscess first appeared. In 57 per cent. of cases which he had investigated the infection had been perivascular; he did not agree that the venous route was the usual one, although in some cases, especially lateral sinus thrombosis, clotting in a pial vein might spread back into the brain. Occasionally an artery might be caught up in the area of infection and a piece of its thrombus might break off as an embolus. The onset in these cases was typically apoplectiform. Once formed the abscess grew at the expense of the white matter, because the grey matter was more resistant, and always towards the lateral ventricle, because this was the direction of the vessels. In the cerebellum it grew at the expense of the white matter forming the core of a lobule, destroying it inward as far as the central mass. The term "capsule" was a complete misnomer, as the wall of a brain abscess was no different from that of an abscess anywhere else. In a very virulent infection there was no evidence of a protective mechanism at all, but only an acute spreading encephalitis. In this type localising symptoms occurred early, and the prognosis was bad. Where the abscess was chronic, and its wall thick, there was a greater chance of recovery if it could be drained, but the signs were fewer and more equivocal. Delay in operation might result in the formation of secondary abscesses.

Mr. W. S. **Sharpe** described a case which had shown the signs of abscess but had recovered under potassium iodide. He thought it possible to overdo surgical search for an abscess that was not there.

Cases.

Sir **James Dundas-Grant** showed a case of cerebellar abscess from thrombophlebitis of the jugular vein. This patient had been shown to the Section before. Opening of the lateral sinus, jugular vein, and jugular bulb had been followed by symptoms of abscess in the cerebellum; these had only been relieved by additional drainage behind the mastoid. Recovery had been satisfactory. He also showed a case in which vertigo had been cured by ossiculectomy, which had revealed cholesteatomatous masses pent up by the ossicles.

Mr. C. **Hamblen Thomas** showed a girl, aged 11, who had suffered for two years from intermittent earache without other symptoms. X rays had shown one mastoid acellular and the other highly cellular. After rest and treatment with antiphlogistine the patient had recovered.

Mr. T. B. **Layton** showed a case of recurring meningitis appearing first three weeks after septicæmic mastoiditis in a boy of 11. The second attack had appeared ten days after the first, and had been followed by steady recovery.

Mr. W. H. **Jewell** showed specimens from a case of actinomycosis of the brain in a woman aged 29. The symptoms had been frontal and occipital headache, photophobia, and pain in the eyes, with apathy and slow cerebration. The pupils had been unequal and active. Finally anæsthesia had supervened, followed by paresis of leg, arm, and lower half of face. The headache, apathy and fever, but not the paralysis, had been relieved by evacuation of extradural and subdural abscesses in the right Rolandic area, but 17 days later she had died.

SECTION OF ANÆSTHETICS.

At the meeting of this Section on Feb. 7th, with the President, Dr. R. E. **Apperly**, in the chair, a discussion on

Anæsthesia in Thoracic Surgery

was opened by Dr. C. **Langton Hewer**. Before 1914, he said, intrathoracic operations were regarded as a risk, but thoracotomy could now be performed with almost the same safety as laparotomy. This widening of the field of operation was largely due to improved anæsthetic technique. Dealing first with the preparation of the patient, Dr. Hewer said purgation of the patient before the operation was now considered undesirable. The drinking of as much fluid as could be comfortably taken for two or three days before the operation seemed to reduce post-operative vomiting and acidosis. Patients so treated did not show a dry skin and scanty urine, and the dilution of whatever poisons were present in their system was all to the good. He was not sure about glucose being useful, and he thought that large preliminary doses of hypnotics should be avoided; hyoscine gr. 1/100 and morphia gr. 1/4 sufficed for the average man, hyoscine gr. 1/150 and morphia 1/6 for a woman. After operation a larger quantity of warm saline could be given rectally while the patient was unconscious than after consciousness had returned. He gave 1¾ pints of saline, containing 5 per cent. glucose, while the wound was being closed. Operating table and bed at the time of the operation should be kept hot. As it was difficult to keep a large ward at the requisite warmth, he advocated the provision of recovery rooms, where patients could remain after operation until the temperature had returned to normal and the general condition was satisfactory.

Usually the subjects of thoracic operations were in poor condition; they might have phthisis, bronchiectasis, empyema, pulmonary abscess, or tumour. Operation caused oozing from large surfaces, with corresponding shock, and opening of the pleura meant a disturbance of the normal pressure relationships in the chest.

Requirements in Chest Operations.

In Dr. Hewer's opinion, the chosen anæsthetic for thoracic surgery should have the following characteristics: (1) It should have no depressant effect on the body, even though the administration might have to be prolonged. (2) It should have no harmful effect upon either normal or diseased lung. (3) It should not interfere with secretion in the respiratory passages, or abolish the reflexes, thus preventing evacuation of sputum immediately after operation. (4) Rapid recovery should be possible, and the anæsthetic should ensure adequate oxygenation of the blood, even when normal respiration was obstructed. Local analgesia had a useful place in the surgery of the chest, but high spinal block was not, in his view, justifiable. The pain after it was employed was greater than that which followed general anæsthesia, especially when intercostal nerves had been blocked. The power to cough was impaired for some time after a block, owing to temporary paralysis of abdominal muscles. Moreover, pleural shock might be responsible for an alarming amount of collapse. It must be remembered that injection of a minute quantity of novocain and adrenalin was capable of causing heart failure. He considered that injection of a solution without performing the aspiration test and without seeing that the needle point was always on the move, had led to deaths. When local analgesia was employed, no protection was afforded against respiratory obstruction, nor against collapse of the lung when the pleural cavity was opened. And the method was not good for young children, nor in cases where the injection would have to be made through septic areas.

Dr. Hewer was anxious that the good points of chloroform should be kept in mind. This was not irritating, it did not cause an increase of saliva and mucus, nor did it appreciably increase the depth of respiration. Indeed, he considered that chloroform had a definite place in thoracic surgery, especially in patients with a high respiratory obstruction. Ether permitted a light degree of anæsthesia to be maintained without risk of a cardiac failure. Often it was useful to give it by the open method to children who were too small to have nitrous oxide and oxygen properly. For extensive operations on the chest, however, he did not think ether was satisfactory, since it was liable to irritate the respiratory passages, and might thus increase the quantity of secretion there. Also vomiting was likely if the administration was prolonged. Of both paraldehyde and avertin it could be said that they interfered with the coughing reflex. Nitrous oxide and oxygen were in a different category, for nitrous oxide seemed to have no chemical effect, but acted physically by limiting the oxygen supply to the cells of the cerebral cortex. Moreover, this anæsthetic seemed to have no deleterious effects on either normal or diseased tissues. Tuberculous animals had had nitrous oxide and oxygen for 24 and 36 hours without aggravating their disease. This anæsthetic had many advantages for chest work, and if the patient vomited more than once immediately after regaining consciousness the cause was usually something other than the anæsthetic—perhaps the use of scopolamine and morphia before operation. The only real disadvantage in its use was poor muscular relaxation, and this was not very important in thoracic surgery. Ethylene and oxygen could be used in the same way, and with the same apparatus as nitrous oxide. But commercial ethylene had an unpleasant smell, and might cause nausea and vomiting; it was also highly explosive, and dangerous to use in the X ray room, or when lung tissue was to be cauterised.

Discussion.

Dr. I. W. MAGILL thought that all that was required in the way of anæsthetics in chest cases was local analgesia, supplemented, if necessary, by nitrous oxide and oxygen. When a pleural cavity had to be opened, the anæsthetist should be prepared for the accidental opening of the other pleural cavity, but Dr. Magill had seen this accident happen only once. And at the operation there was always the possibility of hæmorrhage from a large vessel, or the opening of a bronchus. It was a great advantage to have pneumothorax done before the operation. Local anæsthesia could be used for such operations as thoracoplasty. Nitrous oxide and oxygen was his choice for chest cases, using a face-piece instead of intubation.

Mr A. TUDOR EDWARDS, speaking as a surgeon, agreed about the great part played by improvements in anæsthetics in the advance of thoracic surgery. He thought that the smaller operations should always be done under a local anæsthetic; the same applied to empyema and usually to abscesses. Ordinary gas-and-oxygen anæsthesia was extremely satisfactory. Only when the mechanics of the chest were being altered was there need to induce a positive pressure. In thoracoplasty for tuberculosis or bronchiectasis the shock was greater than in other cases. Opening both pleuræ at the same time was seldom done, and it should not be attempted in substernal goitre cases.

Mr. J. E. H. ROBERTS said that in these chest operations even more important than the choice of the anæsthetic was the choice of the anæsthetist. Experience was essential. The operations could be carried out without shock where no infiltration of intercostal nerves was done.

Mr. T. P. DUNHILL pleaded for the use of chloroform in appropriate cases. Pathologists and coroners in London had done much to deprive chloroform of its rightful place in the armamentarium of the anæsthetist.

Dr Z. MENNELL said that for intrathoracic goitres, exploration of the mediastinum, and operations on the œsophagus the patient's safety and comfort, as well as the surgeon's happiness, were best served by light intratracheal ether. This was not so necessary in cases of definite disease of lung, and ether was contra-indicated in them. He emphasised the great importance of rapid operating in chest cases. He also added a plea in favour of using chloroform in suitable cases.

SECTIONS OF PSYCHIATRY AND NEUROLOGY.

MILDER FORMS OF THE MANIC-DEPRESSIVE PSYCHOSIS.

THE Section of Psychiatry held a meeting on Feb. 11th at which members of the Section of Neurology were invited to be present. Sir ROBERT ARMSTRONG-JONES, President of the Section of Psychiatry, took the chair, and Sir E. FARQUHAR BUZZARD opened a discussion on the Diagnosis and Treatment of the Milder Forms of the Manic-depressive Psychosis. He deplored that writers of text-books in general ignored the milder forms of the manic-depressive psychosis, and the distinction between the neurotic and psychotic forms of depression. In addition to mild forms which differed from the severe forms only in degree, there were many mild [illegible] which showed no history of preceding elation or depression. The ætiological significance of any possible source of anxiety must not be assumed without inquiring whether the alleged cause was still operative or whether its removal had produced improvement. There might, again, have been a history of restless activity and aggressiveness in ordinary affairs. The patient would complain not exactly of depression but of a detachment from reality and of a lack of interest and affection, for which he blamed himself. The absence of a concentration on one particular cause did not necessarily rule out psychotic depression. The depression was worst in the early morning and little influenced by environment; it was intensified by fatigue, and might lift unaccountably, especially towards the end of an attack. Fears of insanity or disease might be associated with it. Grief was not easily provoked, though some patients wept copiously without cause. Insight was good, but concentration, decision, and attention were bad. Psychotics were less troubled by insomnia than neurotics, but might resist sleep for fear of the depression on waking. They had more to say about their brains, and morbid and suicidal thinking was an almost constant feature. Suicidal attempts were more usually premeditated. Psychotic disturbance was always associated with physical disorder. The normal personality gave little diagnostic help, but a woman who became restless and domineering and then depressed was almost certainly of the psychotic type. Psychotics nearly always showed a high percentage of mental disorder, suicide, and alcoholism in the family history; the predisposition seemed to be directly transmissible, and alcoholism to be a direct result of the periodic psychosis. The milder the form, the more difficult the diagnosis, which in most cases required much time and care. No therapy seemed to prevent or shorten the attack. Most patients recovered if their sleep was secured and they were guarded against their friends' misguided efforts to arouse them. If the patient felt inefficient at work, he should be ordered complete rest on the physician's responsibility, but for some it was better to continue. The danger of suicide must never be forgotten, and congenial and tactful companionship should be provided. Physical well-being must be sought in every possible way. No disorder more demanded the guidance, comfort, and protection of an understanding physician.

Cyclothymia as a Biochemical Problem.

Dr. H. CRICHTON-MILLER objected to the term "manic-depressive psychosis" for the mild forms as too strongly suggesting the mental hospital and hindering the general recognition of the frequency of their incidence; he proposed to substitute "cyclothymia." The basic feature was variability of affective response independently of stimuli. The unstable temperament was a boat with insufficient keel; the cyclothymic was a pendulum. The difference lay in the degree of personal integration. The unstable patient was badly integrated, but the cyclothymic, though he had two contrasted integrations, each in its way imperfect, might in his normal phase show a well-integrated personality. The cyclothymic varied on either side of a norm, but in the case of dual personality one of the two phases constituted a true integration. In true cyclothymia the difference of response depended not on associative but on affective variation, and there might be a surprising degree of maladjustment before rational failure manifested itself. No theory explained cyclothymia and no treatment was fundamentally successful, however good the immediate results might seem. No physiological basis for the alternation had been discovered; the basal metabolism and blood-sugar were not changed. Nevertheless, the periodicity seemed to be a somatic rather than a psychological quality. The similarity of cyclothymic exaltation to alcoholic euphoria and of cyclothymic depression to that of intestinal absorption suggested a chemical factor, presumably acting on the thalamus. The reproduction of the cycle on a small scale in the menstrual cycle, and the fact that a relatively small proportion of patients led physiological sex lives, suggested that this biological factor might be hormonic; a rhythm-disequilibrium of hormonic function which tended to be self-limited, and which resulted in an endogenous toxæmia affecting thalamic activity in two contrasted ways and influencing cortical activity *only* in a secondary manner.

Dr. GEORGE RIDDOCH said that the depressed phase was more difficult than the exalted to differentiate from similar neurasthenic states, and that the previous speakers had been wise to stress it. He believed that emotional disturbances could precipitate the psychosis. The depression might lift during the day and sometimes after a night's sleep, but it had a certain persistency unlike that of the ordinary neurasthenic state. Retardation of physical as well as mental activity was diagnostically important; the psychotic was "furrow-bound." Whereas the neurasthenic projected his troubles, the psychotic took them on himself. A significant and frequent symptom was temporary hallucinosis, even in mild cases. An incautious physician might be led astray by the patient's complaint of other mental and emotional symptoms, and of fatigue, headache, and visceral disorders, and by his silence about his depression. There might be no history of previous attacks; the first sometimes occurred in middle age, especially in women. The history of a previous elation episode was significant, but the absence of it was not.

In treatment the environment was all-important, but much could be done by diligent attention and comprehension of the patient's troubles. The encouragement by relatives of unsuitable activities should be discountenanced, and during the depressed phase the patient was better away from them in an understanding atmosphere with suitable nursing. Dr. Riddoch said he should like to see a home endowed in the country, rather like the Cassel Hospital, where these patients could be cared for, understood, and kept from suicide—a task often requiring great vigilance. It was wrong to send mild cases to a mental hospital; they had full insight and ought not to be surrounded by insane patients and exposed to stigma. Sleep, food, and rest were important. Deep mental analysis was very dangerous, as introspection might plunge the patient deeper into his own misery.

Dr. HENRY YELLOWLEES held that there was a clinical entity to diagnose, and protested most strongly against the view that the difference between trivial downheartedness and psychotic depression was one merely of degree. The popular phase that melancholia was a "caricature" of depression was very misleading. He also looked with grave suspicion upon the term "mild melancholia." Although some forms were less severe than others melancholia, like pneumonia, was never a *mild illness*. Differential diagnosis from neurasthenia was a purely clinical problem and the crucial point in it was that, whereas the neurasthenic was a person of active emotional reactions who bewailed the limitations which his illness imposed upon him, the melancholic, whatever he might seem or be called, was the reverse. The understanding of Kraepelin's point of view, that the emotional state was secondary to the fundamental volitional disturbance, was essential. Of almost equal importance was the recognition of the cardinal neurasthenic symptom—excessive fatigability—and the use of the final touchstone that the neurotic had true insight and the psychotic had not. If he had, however mild his illness, he would not be a psychotic. The physician needed an intimate personal knowledge of the natural history of the disease.

Mild hypomania or elation had the distinction of passing undiagnosed more often than any other condition. The general inability to regard these cases as a whole was vividly illustrated in legal proceedings. The procedure was invariably the same; isolated acts of the patient were described one after the other, and the witness was asked of each one, "Is that a sign of insanity, Doctor?" Dr.

Yellowlees waited almost in despair for someone to protest publicly against this imbecile question, and to insist upon describing and explaining the patient's mental state as a whole, and in his own way.

The fact that the manic-depressive psychosis had to run its course hardly justified the statement that there was no treatment for it. Wise management—a better word than treatment, especially in the depressant phase—depended upon a proper conception of the illness as a whole. Melancholia was ipso facto not amenable to psychotherapy; neurasthenia was amenable to psychotherapy in general, and especially to analysis. Psychotherapy, especially hopeful suggestion, might be a valuable adjunct to the treatment of melancholia; but its modern analytical developments, although they explained temptingly many of the mechanisms of the disorder, could never cure. A frequent and ominous phrase in the newspaper reports of inquests was, "His doctor had been treating him for depression." Practical physicians should do all in their power to refrain from treating patients for depression with such a result as an inquest.

The Frequency of Mixed Cases.

Dr. W. R. **Reynell** said that depression might occur several times before the complete cycle was established. It was not always of the same kind, but might take various forms such as remorse, fear, or resentment. Mild cases might shade off into anxiety or instability, and hard-and-fast classification was impossible, as many cases had mixed symptoms. Some manic-depressives were readily fatigable, others developed fainting fits on the border-line of epilepsy; some migraine subjects occasionally had sudden attacks of depression without headache, which resembled the depressive phase of the psychosis. All the periodic psychoses and neuroses were related genealogically, and in their manifestations. The history of mental disorder in 80 per cent. of relatives showed some structural defect. The occurrence depended on the psychotic potential, without which no stress could produce psychosis. If, however, the patient had an inherited tendency to psychosis, an attack could be precipitated by exogenous or endogenous causes. Neurasthenics often showed cycles of euphoria and depression, and might develop into typical manic-depressives. In most cases, in short, the ætiology was mixed. In treatment, the greater the psychogenic factor the stronger the indication for psychotherapy; the greater the somatic factor the more should the physician rely on rest and physiotherapy. The nature and depth of the psychotherapy depended on the individual.

Dr. **Helen Boyle** stressed the connexion of the disease with excessive or defective thyroid secretion. The condition might often originate, she said, in adolescence, fear being a potent activator of the thyroid, and preventive glandular treatment should be applied at this age. Normal thyroid function had a cyclothymic rhythm. It was important that the patient should have occupation well within her powers, but absence of stress might itself sometimes constitute stress. Dr. W. H. Stoddart had recommended the "regular way," so that the patient could have adequate knowledge of the alteration before the mental and nervous fit became too severe. Insight was usual in the normal state. Contact with a trusted doctor was invaluable, and some form of hydrotherapy might be of benefit.

Dr. E. W. **Neill Hobhouse** pointed out the similarity of the symptoms in early general paralysis to those of mild manic-depressive psychosis; myxœdema he said, might occasionally cause confusion, but it was often possible to be misled by meningovascular syphilis. This sometimes produced mild depression, loss of interest, and occasional outbursts of temper, but the history and the improvement under specific treatment should be sufficient to determine the diagnosis. Some cases of manic-depressive psychosis, mostly women of a definitely efficient type between 25 and 35, resembled hysteria in excitability and a rather noisy combativeness, but did not feel ill and did not desire pity nor seek to attract attention. Another possible source of confusion was hyperthyroidism in the absence of goitre. If these cyclical cases were to be recognised by the practitioner they must be recognised by the student, and they would not be until the term "manic-depressive psychosis," which only suggested the padded cell, was abolished in favour of "cyclothymia."

Dr. E. B. **Strauss** commented on the apparent decrease in the incidence since his early years; the diagnosis had then been too comprehensive. Depression might be the most prominent symptom in a number of other conditions. There was a certain definite connexion between manic-depressive psychosis and allied conditions and the pyknic physique. In addition to the other diagnostic data the measurements and physical type should be ascertained; search should be made for schizophrenic stigmata and the motoricity determined. If the patient had had previous attacks of depression or was usually over-boisterous, and if his physique was predominantly pyknic, the diagnosis was absolutely certain unless the picture was complicated by factors such as arteriopathy and syphilis. Persons with a predominantly schizoid make-up could not develop manic-depressive psychosis, and the physician should suspect catatonic schizophrenia or a mixed psychosis. Pyknic and correlated constitutions could modify the course of schizophrenia to cause confusion. Reactive depression was one of the commonest forms of depression and one of the most frequent sources of error; it was caused by an intolerable situation, and was allied to true neurasthenia or prison psychosis, and was not endogenous or constitutional in the sense of the manic-depressive psychosis. It affected schizoid rather than cycloid types. Institutional treatment was desirable even for the mildest attacks of manic-depressive psychosis. In women at the climacteric a really active ovarian preparation sometimes exerted a remarkable effect.

The **Chairman**, answering Dr. Riddoch, praised the licensed houses under the special hospitals. A very great point in treatment was the "restitutio ad integrum"; no manic-depressive patient became demented. The sudden onset was pathognomonic. There were no hallucinations and no delusions.

Sir **Farquhar Buzzard** replied.

MEDICAL SOCIETY OF LONDON.

At a meeting of this Society on Feb. 10th, with Mr. **Donald Armour**, the President in the chair, a discussion on the

SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS

was opened by Dr. **Gustav Maurer** (Davos). He dealt with the surgical treatment of adhesions which prevented proper collapse of the lung after artificial pneumothorax, and which prevented permanent cure, according to Gravesen and the Matsons, in 37 per cent. of cases. Great service had been rendered, he said, by Jacobæus, who, in 1910, had invented the first practical method of dividing adhesions by a galvano-cautery after discovering their position with a thoracoscope similar in construction to a cystoscope; but although he had obtained improvement in 66 per cent. of patients, cure could never be guaranteed because of the complications of empyema and tuberculous exudate. Exogenous infection could be avoided by care, but endogenous infection was an ever-present danger, because three-quarters of operable adhesions contained lung tissue, the parenchyma losing its vitality through the perifocal inflammation, and becoming drawn up into the pedicle on the induction of pneumothorax. Most adhesions were composed, in varying proportions, of three types of tissue: parietal pleura plus endothoracic fascia; a fibrotic bridge, or the symphysis between the parietes; and the lung pedicle. Owing to the great difficulty of distinguishing the connective tissue from the parenchyma by sight, adhesions were best classified for practical purposes according to their shape :—

(1) Very thin elastic adhesions; division did neither harm nor good.

(2) Adhesions with a broad thoracic insertion and a fibrotic, inelastic symphysis; the parietal pleura was projected in a tent shape. They were rare.

(3) Adhesions with a conical pulmonary insertion and a dense symphysis of long-standing; the devitalised lung was drawn into a pedicle. They were fairly common, and their division was the cause of most empyemata, but if no complications ensued they gave the best therapeutic results.

(4) Hour-glass adhesions, with both insertions expanded, and a fibrotic bridge between. There was less risk of empyema than in the third class, and equal benefit from division. Most important adhesions belonged to this class.

The thicker the adhesion the more serious the condition and the nearer the parenchyma approached the chest wall. The term "division" really implied unskilful technique, and it was absolutely necessary to enucleate adhesions from the chest wall, where they consisted, with rare exceptions, solely of connective tissue. This could not be done with *Jacobæus's* instrument, nor its modifications, on account of the vascularity of the adhesion and the proximity of intercostal vessels. Attempts had been made to replace the galvano-cautery by cutting diathermy, but the strong current required might easily cause deep coagulation and empyema. Dr. Maurer then exhibited his apparatus, and described his own method with high-frequency currents of 0·1 to 0·3 ampères, which only produced a coagulation zone 2–3 mm. wide. For very expanded insertions he used alternate diathermy and galvanic current on the same electrode, with foot control. Local anæsthesia was indispensable, and 0·4 per cent. novocain was given through a long needle. He could enucleate short membranes as thick as a finger, crowded or crossing one another, and rope-like adhesions as thick as a humerus. He held fast to the two-puncture method.

He exhibited water-colour pictures of adhesions and X ray films of cases.

Surgical Methods of Collapse, Accessory or Alternative to Artificial Pneumothorax.

Mr. H. **MORRISTON DAVIES** said that sanatorium treatment, though the simplest, might be inadequate because the disease was so acute, the resistance so poor, or the secondary changes so extensive that its healing effect could not take place in time. If only one lung was involved its collapse would achieve the desired result, but collapse was not always easy.

The commonest indication for operations—phrenic evulsion, thoracoplasty, multiple neurectomy, and *extrapleural pneumolysis*—was the failure to secure complete collapse by artificial pneumothorax. Evulsion had almost entirely superseded simple section because it destroyed the connexion of the accessory phrenic with the main nerve. The operation was done under local anæsthesia, except in young children. As a consequence of the resulting paralysis of the diaphragm, spasm disappeared, respiratory movements were abolished or replaced by paradoxical movement, and the dome of the diaphragm rose. The lung was thus freed from constant strain and partially collapsed, reducing the drag on the mediastinum and relieving the symptoms. The indications for phrenic evulsion were: (1) Basal tuberculosis; it was rarely successful in basal bronchiectasis. (2) Chronic basal effusion with thickened pleura. (3) Generalised tuberculosis when artificial pneumothorax had failed. (4) For the relief of symptoms such as pain, dragging, tachycardia, and dry, irritating cough. (5) As an accessory to artificial pneumothorax when the base of the lung was adherent. (6) As a preliminary to thoracoplasty to reduce the number of ribs needing excision. (7) To prevent the development of bronchiectasis after unresolved basal pneumonia.

Two essentials of thoracoplasty were that the posterior line of division of each rib should be made at the level of the transverse processes and that the excision should include the first rib. These ensured that the ribs dropped and tilted downwards so that the lateral cut ends became approximated to the spine. This produced very considerable collapse of the lung, even if only the first eight, seven, or six ribs were excised. A thoracoplasty limited to the first four ribs was as efficacious as, and preferable to, apicolysis. The collapse, though *partial*, was constant, and the operation produced no crippling deformity. Its indications were those for artificial pneumothorax, but its contra-indications were much more severe. It was only indicated in preference to any other line of treatment in cases of advanced chronic unilateral fibrotic tuberculosis. An active lesion in the opposite lung was a complete contra-indication except in cases of alarming recurrent hæmorrhage. Other contra-indications were tuberculous enteritis, cachexia, a failing heart, albuminuria, and diabetes, but not tuberculosis of the larynx unless there was considerable œdema or involvement of the epiglottis. Thoracoplasty should be performed when a pneumothorax failed to control the symptoms, especially in fibrotic and hæmorrhagic cases, or when the lung was re-expanded; and when a pyothorax was not controlled by an oleothorax.

Multiple intercostal neurectomy gave slight collapse and apparent benefit in some cases, but the number was yet too few for any conclusion. Apicolysis was best performed with a pedunculated graft of pectoralis major or the mamma; paraffin might produce an extrapleural effusion which found its way into the tissues, and fat was apt to degenerate. Mr. Davies illustrated his paper with X ray films.

A Single-puncture Method.

Dr. F. G. **CHANDLER**, while admiring Dr. Maurer's technique very greatly, preferred—in common, he said, with many other workers—to perform the whole operation through one puncture. Davidson, of New York, had invented a successful operating thoracoscope, which combined telescope, lamp, and electrodes in one instrument, but it was large, it had to be moved to and fro in manipulation, and, being oval in section, its rotation opened up the tissues and increased the liability of sepsis. Dr. Chandler had devised[1] a thoracoscope which involved only one puncture, was quite small, and worked through a cannula no larger than that of Jacobæus. It was fitted with a ball which pressed against the chest wall and prevented emphysema, and had only one electrode. Diathermy current was employed and controlled by a foot switch; no smoke was produced. The whole instrument could be boiled. It had a large coagulating electrode at its extremity through which the cutting hair was pushed, and by which it was stabilised.

Stereoscopy might give an idea of the type of the adhesion, but would not localise it. At Victoria Park the patient was examined on a screen and rotated to give an all-round view, and an X ray picture was taken, centred over the adhesion to minimise distortion. A favourable intercostal space was then chosen on a skeleton. The disadvantages of this method were that the adhesion might be of an unexpected shape, and that it was impossible to tell whether it contained lung tissue or not, especially when pleural effusion was present. He wished that Dr. Maurer had said more about localisation. He was experimenting with an instrument by which lipiodol could be injected into the adhesion. Oleothorax maintained a permanent collapse, and prevented the type of adhesion caused by the deposit of fibrin in a costophrenic sinus and the drawing together of the two pleural layers. Olive oil was used, with an admixture of 5 per cent. of an antiseptic called gomenol. The chief indication was obliterative pleurisy.

Discussion.

Mr. **TUDOR EDWARDS** said that he had used a modification of the Jacobæus instrument, and had not found the difficulties which Dr. Chandler had mentioned. He agreed with Dr. Maurer's insistence on dividing the band as close to the pleura as possible and on the necessity for a local anæsthetic. At the apex, however, it was dangerous to divide very close to the pleura as the innominate vein was likely to be injured. He was not quite happy about the effect of the partial thoracoplasty mentioned by Mr. Morriston Davies. The amount of collapse seemed very small in comparison with the amount of rib removed. He also had been very disappointed with apicolysis and had only found it useful where cavities remained at the apex after a more or less complete thoracoplasty, owing to the thickness of the wall or the softness of the lung below.

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[1] See THE LANCET, Feb. 1st, p. 232.

Mr. J. E. H. ROBERTS said that the mixed infection empyema originated in the lung, but when it followed adhesion and consisted of a simple staphylococcus or streptococcus it was often the result of faulty asepsis or a contaminated anæsthetic. From his experience of the technique in other countries he was surprised that the incidence of empyema was so low.

In phrenic avulsion it was possible to tear lymphatic vessels in pushing aside tuberculous lymphatic glands and to give rise to local effusions in the neck. He preferred a two-stage complete thoracoplasty to the partial thoracoplasty advocated by Mr. Davies. That immobilisation was very important was proved by the results of neurectomy of the intercostal nerves performed by Alexander. In place of apicolysis he preferred an operation which he had learnt from S.W. Harrington of the Mayo Clinic; the ribs over the cavity were resected subperiostially and gauze was packed in against the mobilised periosteum, underneath the skin and overlying muscle. Pressure was exerted upon the outside of the lung by the collapsed periosteum and maintained by the regeneration of the rib. This method avoided the use of a foreign material, which might give rise to necrosis.

Reply.

Dr. MAURER, in reply, said that the main argument against the one-puncture method was the general impossibility of localising adhesions accurately enough to introduce the cautery at right angles to the thoracic insertion. The local anæsthetic could not cause a mixed empyema; he had not had one in 400 cases.

Mr. MORRISTON DAVIES asked why, if Mr. Roberts approved of the results of immobilisation by Alexander's intercostal neurectomy, he should not approve of the local thoracoplasty for the local lesion. It did the same work and gave still more collapse.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 1ST, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 354 (last week, 313); scarlet fever, 3035; diphtheria, 2051; enteric fever, 38; pneumonia, 1265; puerperal fever, 58; puerperal pyrexia, 98; cerebro-spinal fever, 15; acute poliomyelitis, 2; acute polio-encephalitis, 1; encephalitis lethargica, 22; continued fever, 1; dysentery, 10; ophthalmia neonatorum, 108. No case of cholera, plague or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Feb. 4th–5th was as follows:—Small-pox, 558 under treatment, 28 under observation (last week, 523 and 29 respectively); scarlet fever, 2371; diphtheria, 2768; enteric fever, 18; measles, 971; whooping-cough, 106; puerperal fever, 31 (plus 19 babies); encephalitis lethargica, 121; "other diseases," 17. At St. Margaret's Hospital there were 20 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (0) from enteric fever, 48 (24) from measles, 14 (4) from scarlet fever, 35 (4) from whooping-cough, 45 (13) from diphtheria, 47 (15) from diarrhœa and enteritis under two years, and 57 (7) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever were reported from West Hartlepool 2, Stockport 1. Measles accounted for 8 deaths in Manchester, 2 each in Wigan and Sheffield. There were 8 deaths from diphtheria in Liverpool and five from diarrhœa. Influenza was credited with 6 deaths in Birmingham, 3 each in Manchester and Leeds.

The number of stillbirths notified during the week was 297 (corresponding to a rate of 47 per 1000 births), including 41 in London.

FATAL CASE OF VARIOLA MINOR IN LEICESTER.

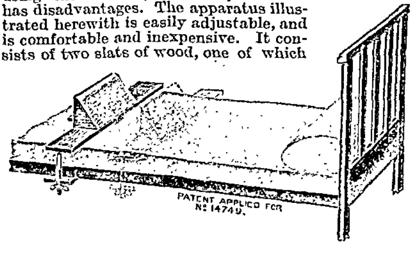
As we noted last week, small-pox was mentioned as a cause of death in a case assigned to Leicester. Dr. C. Killick Millard, medical officer of health, writes: "As this is the first death from 'small-pox' in Leicester for over a quarter of a century (the last death having occurred in June, 1904) it calls for some comment. The victim was a weakly baby, bottle fed, the youngest of a large family, who was infected by an overlooked case in the family within a few days of birth. The child was taken ill on Jan. 13th; the eruption appeared on the 15th, and the child was admitted to hospital, together with its mother and elder brother, both suffering from the disease, on the 18th. The *child was then in an obviously serious condition.* There was a fairly abundant rash and the child had been refusing food and suffering from vomiting and diarrhœa for the last few days. It died the day after admission.

"This case illustrates what is now well recognised—namely, that variola minor, although ordinarily a non-fatal disease, may occasionally, like varicella and other non-fatal diseases, prove fatal when it occurs in very young infants."

New Inventions.

BED FOOT-REST.

THIS is a simple apparatus which will enable a patient to be kept in the sitting position whilst in bed. Up to the present the means of doing this has been by using the ordinary "Donkey" which has disadvantages. The apparatus illustrated herewith is easily adjustable, and is comfortable and inexpensive. It consists of two slats of wood, one of which is placed under the iron frame of the bedstead, and the other, to which the foot-piece is fixed, is placed over the mattress. These two slats are clamped at each end with screw clamps. A pillow is then folded over the foot-piece.



Messrs. Allen and Hanburys, Ltd., 48, Wigmore-street, London, W., are the makers.

HUGH F. EALAND, L.R.C.P. & S. Edin.,
L.R.F.P.S. Glasg.

A ROMAN CATHOLIC HOSPITAL.—The sisters of Our Lady of Compassion, who established a Nursing Home in the Lambeth Ward some 30 years ago, have purchased for £30,000 the freehold of the property and intend to rebuild the premises and establish a hospital at a total cost, including that of purchase, of £100,000.

Reviews and Notices of Books.

SURGICAL DISEASES OF CHILDREN.

Third edition. By SAMUEL WALTER KELLEY, M.D., LL.D., F.A.C.S., Member, Senior Staff, St. Luke's Hospital, Cleveland, Ohio; Major and Brigade Surgeon, U.S. Volunteers. London: Henry Kimpton. 1929. 2 vols. Pp. 1374. 63*s.*

AMERICAN physicians have devoted much time and ink to "pediatrics," but it is clear from the preface to these two handsome volumes that the surgery of childhood has received much less attention. Dr. Kelley speaks of his work as a pioneer endeavour when the first edition appeared 20 years ago. The volumes in their present form are well able to bear comparison with any British work on the subject. The book has evidently been completely rewritten, and 300 new illustrations have been added, so that the publishers have justification for their claim that it is practically a new book.

The author takes a wide view, and encourages his readers to treat the child and not only the disease. In this connexion he devotes space to drugs, feeding, and stimulants, and lays emphasis on the general care of the patient. Anyone who expects to find striking differences between American methods and our own will be disappointed. The book conforms in most respects to generally accepted teaching on this side of the Atlantic; there is nothing startling, but the presentation is sane, sound, and well balanced. In one or two instances the author is dissatisfied with present-day procedure, but even here it seems that his own countrymen are offenders no less than ourselves. He presents a strong case for more frequent operation on depressed fractures of the cranial vault in babies (p. 606), and a well-argued and interesting plea for immediate decompressive operations when intracranial birth hæmorrhage has been diagnosed (p. 611, *et seq.*). Lumbar puncture is now the approved procedure in America, but Dr. Kelley maintains, with good reason, that though the mortality in operated cases is 50 per cent., "the alternatives are so dreadful that this should not deter us" from a more radical attack when necessary. In England we see many older cerebral diplegics, but they very rarely find their way to hospital within a few hours of birth. The obstetrician and the general practitioner could remedy this, and Dr. Kelley looks forward to the time "when professional opinion will demand operation in all cases of depressed bone or intracranial hæmorrhage in the new-born whenever there are enough symptoms to make a diagnosis."

Harelip and cleft palate receive full notice, although the author is a little vague about the best age for operation; he seems to favour closure of the lip at about three months and of the palate at six to nine months. He believes that strapping plaster is useful as a preliminary to operation on harelip and some of his photographs seem to bear this out. Cleft palate is closed by Langenbeck's operation. Brophy's procedure is thought to carry a high mortality and to give bad functional results, whilst Lane's flap operation is scarcely mentioned. In the section on surgical tuberculosis the teaching is sound. Non-operative treatment of bones and joints is preferred, but under certain conditions operation is not only justifiable but imperative. The author sometimes uses the Paquelin cautery as a counter-irritant in joint tubercle and then applies plaster-of-Paris. This seems a dangerous proceeding, and not to be commended on general principles. Nearly all the sections on orthopædic subjects are good, both instrumental and operative treatment being fully considered. Several references are made to gonococcal arthritis, which is rare amongst British children, but may be commoner in America. Volkmann's contracture is not particularly well presented; the condition is important enough to be illustrated, and Max Page's operation deserves mention. In considering the abdomen, Dr. Kelley makes it clear that appendicitis in children brooks no delay, and immediate operation is the general rule; colostomy for "megacolon" may sometimes prove sufficient, and, of course, has a much lower operative mortality than colectomy. Intussusception is dealt with on standard lines, though the author devotes a good deal of space to injection methods. Chest surgery is mainly represented by empyema, to which 23 of the 35 pages in the chapter are devoted. Surgery of the air passages receives two chapters, including a valuable article on intubation, which is considered with unusual wealth of detail.

Many of the photographs and diagrams are excellent, and it appears that the author is personally responsible for most of them. The series photographs, in which we see the same condition on four or five separate occasions, are particularly interesting. The book is admirably printed and produced.

A COURSE IN PHYSICS.

For Medical and Dental Students. By RICHARD ABLETT, M.Sc., Lecturer in Physics, University of Liverpool. With a foreword by L. R. WILBERFORCE, M.A., Professor of Physics in the University of Liverpool. London: Humphrey Milford, Oxford University Press. 1930. Pp. 249. 8*s.* 6*d.*

THERE are several well-known volumes containing the information on physics necessary for the preliminary examinations in medicine and such specialties as dentistry and pharmacology, but this is not to say that there is no room for such an excellent little textbook as the one now before us. It is short, accurate, well-produced, and by no means dear. At the same time the brevity of the book, which certainly is one of its merits, may have been obtained sometimes by the sacrifice of a good deal which the student will have to know before he can follow the teaching, and some of which might have been recalled to his mind. It is true that in the preface the author points out that the number of university students who intend to pursue a medical course, and who before entry had no instruction at school in physics, is rapidly decreasing, but from the very beginning of the book it is clear that Mr. Ablett attributes to his audience considerable familiarity with the subject. Given the necessary preliminary knowledge needed to make reading of the book of practical use, the author may be congratulated on having produced a sound and valuable treatise. Difficult sections under the general heading of electricity are notably clear, and such sections can be used as a test, being so often hard of comprehension in small manuals. The author's claim to be teaching physics throughout as physics, while bearing in mind the value of applications to and illustrations from medical practice, is substantiated, and the subject made real and living to the medical student, if only he is sufficiently grounded to assimilate the teaching—a doubt which will remain in our mind.

CREATINE AND CREATININE.

Monographs on Biochemistry. By ANDREW HUNTER, M.A., M.B., F.R.S. Can., Professor of Biochemistry in the University of Toronto. London: Longmans, Green and Co., Ltd. Pp. 281. 14*s.*

THESE monographs on biochemistry are among the most useful series of publications in modern biochemical literature, since they make it possible for readers to keep pace with the most advanced views of this rapidly growing science without having to wait for a new edition of some large text-book. The monographs not only contain far more detail about facts and methods than would be possible in one volume, but they are authoritative treatises. Dr. Hunter's contribution to the series is divided roughly into two halves, the first four chapters being a compilation of all known facts, and the last five dealing rather more with theories and interpretation. The first chapter provides a brief history of creatine and creatinine from the date of Chevreul's first discovery of the former in 1832, ending with some of the controversies of recent times regarding the structure of these substances. The second chapter is a long one and deals very fully with the general chemistry and the derivatives of creatine and creatinine. Then follow various methods of preparing these substances from different sources, and methods of quantitative determination. Chapter 4 is on the distribution of creatine and creatinine in biological substances, and includes some comprehensive tables. The next two chapters deal with the output, metabolism, and origin of creatinine, while the last three are devoted to studies of the physiology and origin of creatine, creatinuria being the subject of one of them. The author deserves congratulation upon the excellent bibliography, which is almost as complete as it could possibly be, and is the more valuable since nearly every reference has been made from the original paper.

Physical Diagnosis.

Diseases of the Chest and the Principles of Physical Diagnosis. Fourth edition. By George William Norris, A.B., M.D., Professor of Clinical Medicine in the University of Pennsylvania; and Henry R. M. Landis, A.B., M.D., Sc.D., Professor of Clinical Medicine in the University of Pennsylvania. London: W. B. Saunders Co., Ltd. 1929. Pp. 954. 45s.

This well-known text-book deals with the physical diagnosis of the heart and lungs in health and disease. The first 295 pages are devoted to a detailed account of the respiratory and circulatory systems in health. The teaching of physical signs and methods of examination applicable to the normal subject has been sadly neglected, though the importance of such a study is becoming more and more recognised; the student and practitioner will find a full description of modern methods of examination, including a chapter on the electrocardiograph from the pen of Dr. Edward B. Krumbhaar. X ray examination, in our view, is dismissed too briefly as merely a control to other methods of diagnosis; important as these general methods are, X ray will frequently disclose disease which was quite unsuspected, even after the most careful examination by other means. In this book are included many excellent skiagrams showing various morbid conditions.

An article by Dr. Louis H. Clerf on the value of the bronchoscope in diseases of the bronchi and lungs is useful. Whilst describing the many indications for bronchoscopic examination, the author points out its limitations, and notes that only the larger bronchi can be examined by this method. The third and fourth parts of the book deal with diseases of the intrathoracic viscera, the signs, symptoms, and morbid anatomy of the various conditions being fully described. To the practitioner and senior student interested in intrathoracic disease this work will be of great value.

Zoological Science in Persia.

The Zoological Section of the Nuzhatu-l-Qulub of Hamdullah Al-Mustaufi Al-Qazwini. Edited, translated and annotated by Lieut.-Col. J. Stephenson, C.I.E., M.B., D.Sc., F.R.C.S., I.M.S. (ret.), Lecturer in Zoology, Edinburgh University. Royal Asiatic Society. Pp. 100.

The interest of this very early Persian work, which has been translated and annotated with great care by Colonel Stephenson, lies in the fact that it is a record of the actual state of zoological science in Persia during mediæval times. It is a section of a much larger work by the same author which was essentially a popular dictionary of science, concerned with a description of the animals then known and their relationship to man. One gathers that the author was not himself a scientific observer or field naturalist, but rather a compiler of facts already recorded by others. The work provides a fairly comprehensive idea of the materia medica of the day, at least so far as drugs of animal origin were employed. The short description of the characteristics of each animal is followed by a list of the medical uses of its various organs.

The diseases coupled with these drugs are even more interesting, since many of them are easily recognisable, the commonest maladies being the eye-troubles associated with arid, tropical climates, leprosy, malaria, and tuberculous glands. The removal of superfluous hair is a subject which evidently attracted considerable attention. A formidable list of depilatories are recommended, among which horses' sweat, porcupines' bile, tortoise and rhinoceros blood and eggs, leeches' and bats' dung seem to have been popular. An equally long list of medicines reputed to cause the growth of hair is given, but it is obvious that aphrodisiacs were the primary concern of the medicine man of the day and there is hardly an animal mentioned whose testicle when ground up and mixed with honey was not regarded as a sovereign remedy for restoring sexual power to the aged or impotent. Cantharides is mentioned as a violent poison, but curiously enough its aphrodisiac effect does not appear to have been suspected. For the most part the remedies recommended are of a magical nature and seem to have no reasonable foundation. The tradition of many of them still lingers in remote parts even of this country, and some are still practised—for example, the use of cobwebs in staunching the flow of blood from a wound. Some of the remedies advised must have led to results worse than those attributable to the disease.

The translation of this work will no doubt be of considerable interest to oriental scholars and those interested in early medical history. The original Arabic from which the translation was made is printed in full at the end of the book.

Possession, Demoniacal and Other.

By T. K. Oesterreich, Professor at the University of Tübingen. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1930. Pp. 400. 21s.

This survey of the history of demoniacal possession among primitive races, in the Middle Ages and in modern times, discusses also artificial and voluntary possession, and, in ranging from prehistoric dates to the present time, takes note of manifestations all the world over which seem to fall within the scope of the title. The translation is from the German, although for certain notes an authorised French version has been employed. The book is the result of investigations which have been published in the *Deutsche Psychologie,* but the subject matter has been considerably extended here since the original publication. The copious quotations, in respect of which careful bibliographical references are made, are responsible for the size of the volume, while in this way the literature essential for pursuing any of the indicated lines of thought further is brought to notice.

Prof. Oesterreich quotes the New Testament, Lucian, and the Acta Sanctorum in the introductory chapter, and goes on to describe the external signs of possession, describing a condition when the sufferer's organism appears to be "invaded by a new personality. . . . as if governed by a strange soul." Once this is granted, the wealth of information in respect of the external signs of possession, the subjective state of the possessed, and the manner and methods of exorcism become removed from the category of curious narratives to be ranged under that of psychological evidence, but, whether or no this is the view which Prof. Oesterreich would have us take, the ethnological interests of the book remain exactly the same. A complete disbelief in the existence of such a thing as demoniacal possession would not make the collation of stories less informative and instructive as evidence of human thinking and manners. A particularly interesting chapter is that on Shamanism, a designation for artificial and voluntary possession amongst primitive people where Mr. and Mrs. C. G. Seligmann, Frobenius, Tremearne, and Mariner are freely quoted from. A further section treats of voluntary possession as seen among higher civilizations, and here there will be found an elaborate account of the ritual accompanying the delivery of the Delphic Oracles as well as the arguments for belief in the veritable existence of the Sibyls. Much of the literature, citations from which occupy so large a proportion of the author's pages, will be familiar to medical men interested in psychology and neurological pathology, but a number of passages are set out from authors whose scientific views will be unknown to most readers.

The human race is certainly seen in a fantastic light in the discussion of the relationship of possession to the manifestations of spiritualism, or the phenomena of hysteria, and in many places Prof. Oesterreich points to paths of research which might be followed.

EVOLUTION OF THE EARTH AND MAN.

By Twelve Authors. Edited by Prof. G. A. BAITSELL. New Haven: Yale University Press. 1929. Pp. 476. With 83 figures. 22*s.* 6*d.*

THE scope of this book is well indicated by its title—it is an account of the origin and progress of the earth and of those that dwell therein. Written by 12 different authors, it naturally lacks the coherence of a well-ordered tale, but between them the chapters seem to cover most of the ground, and each one by itself has the advantage of an expert's knowledge and experience. There is a certain amount of jargon, for instance, the "heavings of the earth's broad breast" which Prof. Lull brings into his account of vertebrate evolution; the frontispiece, too, is more fit for the movies and may give a wrong idea about a serious and very readable book. As the Laureate has lately reminded us, his evolutionary connexion with animals is the most significant fact about man in all his aspects and relationships. It is therefore impossible to pick out any of the chapters as having a particular importance for modern medicine; they are all germane. Immediately, perhaps, Prof. Huntington's summary of his conclusions about the bearing of climate on human life has the greatest hygienic interest, and it is certainly cheering to read once more that "there is no climate which excels that of south-eastern England in its healthfulness and its stimulus to vigorous physical work, hard study, and creative mental activity." Londoners evidently have something to live up to.

PUBLIC HEALTH AND HYGIENE.

A Student's Manual. By CHARLES FREDERICK BOLDUAN, M.D., Director, Bureau of Health Education, Department of Health, City of New York. London: W. B. Saunders Co., Ltd. 1929. Pp. 312. 12*s.* 6*d.*

THIS manual endeavours to cover in relatively small space the whole range of public health activity. It is divided into five sections, dealing with general introductory considerations, important communicable diseases, other important preventable diseases and conditions, community hygiene, and prevalence of disease. The book contains a mass of detail, but little balanced assessment of the value of the various lines of procedure or the theories on which they are based. The terminology is needlessly unscientific for a book intended for medical students, and such important problems as immunity are dealt with in rather a scrappy way. Vitamin D is not mentioned in connexion with rickets. The chapter on food poisoning gives the wrong impression that food containing the bacteria or toxins responsible for such poisoning is almost always offensive in taste or smell; the view expressed that *B. paratyphosus* is sometimes responsible for food poisoning is now discredited; *B. aertrycke* is not here mentioned in this connexion. The book is copiously illustrated. On the whole, the illustrations are well produced and apt, though some of them, notably Fig. 100, with its caption "Gardez l'eau," are not of great value. If the author had been a little less ambitious his book might have been useful for the training of nurses and other non-medical workers; it is not very suitable for medical students.

MAMMALIAN PHYSIOLOGY.

A Course of Practical Exercises. Second edition. By E. G. T. LIDDELL, D.M., Fellow of Trinity College, Oxon.; and Sir CHARLES SHERRINGTON, O.M., M.D., D.Sc. Cantab., F.R.S., Waynflete Professor of Physiology in the University of Oxford. Oxford: At the Clarendon Press; London: Humphrey Milford. 1929. Pp. 162. 15*s.*

THE merits of the course on Mammalian Physiology by Prof. Sherrington have long been gratefully recognised by all who have worked on this subject, and we welcome a second edition of this classical work. The wealth of detail supplied on those points of technique which are necessary for the success of the experiments are likely to reduce to a minimum the chances of failure. Prof. Sherrington has made possible the application to classwork of an instructive and stimulating series of experiments which had been undertaken for the most part by experts and research workers. The second enlarged edition of the book has been compiled with the help of Dr. E. G. T. Liddell, who has worked with Prof. Sherrington for some years. It retains its original scope; the conduct of each experiment illustrating a physiological principle is given as an exercise, and each exercise is supplemented by a series of interesting and suggestive observations, including references. New exercises in this edition are those on the decerebrate knee-jerk, the inhibitory action of the cerebellar cortex, tetanus and immunity, and Prof. J. Mellanby's method of preparing secretin has been given in the exercise illustrating its action. The diagrams of apparatus and dissections are admirable.

THREE PLAYS:

The Switchback; The Pardoner's Tale; The Sunlit Sonata. By JAMES BRIDIE. London: Constable and Co., Ltd. 1930. Pp. 156. 7*s.* 6*d.*

HERE we have three plays, called respectively a comedy, a morality, and a farce-morality, bound in one volume. "The Pardoner's Tale" is, of course, an adaptation from Chaucer. The scene is laid in Scotland, in the eighteenth century, the characters being described as "three second-rate bucks," and the narration of the three murders which ends their carousals is a clever performance, which, however, seems to us to fail, despite the author's intention, to give an impression of utter horror. This macabre piece has not been staged, but "The Sunlit Sonata" has been played by the Scottish National Players in Glasgow. This is a bitter and brilliant indictment of many attitudes, convictions, and persons, and if the farcical side overshadows the moral side, probably this has been the writer's design. From the accurate description of the characters, especially where the Deadly Sins are introduced in appropriate costume, he will have drawn his inspiration for the dialogue. The outstanding feature in these two pieces is their originality, but in "The Switchback" we have really subtle character drawing, humour, and sense of drama. It is this play, which was produced last year at the Birmingham Repertory theatre, which has brought the volume to our notice, for here the medical situations supply the main arguments in this story. That story is neither very nice nor very probable, but the various characters tell it with force and humour, though the main exponent of the comic side of things as they occur fails occasionally to be comic when her attempts are most vigorous. Medical men familiar with the muddle in which the novelist or dramatist generally finds himself when dealing with professional problems will not be surprised to learn, on the evidence of this play, that the author is a doctor who is writing under a pseudonym.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 15, 1930.

DIET AND THE TEETH.

FOR the last 12 years Mrs. MAY MELLANBY has devoted herself to a study of the effect of various kinds of diet on the development and structure of the teeth, and especially upon their liability to disease. This work, begun at the field laboratories in Cambridge, has been continued since 1921 at the University Field Laboratory in Sheffield, which was equipped by a donation of £1000 from local insurance funds—an example of imaginative expenditure on the part of panel practitioners whose reward has been immediate. Throughout this time Mrs. MELLANBY has published a number of papers dealing with various aspects of this field research, and has succeeded in producing convincing evidence that the teeth are peculiarly sensitive to the presence (or absence) in the diet of specific food factors which determine not only the perfection of dental structure, but also the resistance to influences which initiate decay. Every step in her argument has been taken after exhaustive investigation, and the protocols of her experiments, as far as they deal with the structure of teeth in dogs, are now issued, in a lavishly illustrated report, by the Medical Research Council.[1] Fortunately the results lend themselves to summary.

The development in dogs of perfect teeth, Mrs. MELLANBY writes, can be ensured by an adequate supply of vitamin D, either as found in natural foods—e.g., egg-yolk, milk, suet, cod-liver oil—or as artificially produced in foods by irradiation of their ergosterol content or even by irradiation of the animal's skin. Proteins, carbohydrates, and most vegetable fats and foods such as cereals, oranges, and egg-white have no calcifying powers. Lard and bacon fat are usually deficient in vitamin D but vary, probably with the diet of the animal from which they are obtained. If the diet of a puppy is changed from one poor in fat-soluble vitamins to one rich in these substances there is an immediate response shown by improved calcification. When the process is reversed the response is delayed for a comparatively long period. An increase in the cereal intake has a deleterious effect on calcification apart altogether from its effect on the rate of growth. This effect is only marked when there is a certain deficiency of vitamin D, and it can be entirely overcome by a sufficiency of this vitamin in the diet. Cereals differ greatly in their anticalcifying effect on the teeth. Of those tested, oatmeal had the most effect, white flour the least; intermediate between these came maize (next to oatmeal), then barley, rye, whole-meal flour, and rice (polished and unpolished), the last corresponding closely to white flour. Wheat and maize germs were also found to have a deleterious effect on calcification. Mrs. MELLANBY has failed to associate the anticalcifying effect of cereals with any one known constituent of food such as (1) the absolute or relative amounts of calcium and phosphorus, or (2) the carbohydrate, fat, or protein, or (3) the acid-base ratio of the mineral substances. Her evidence suggests that there is a chemical entity of unknown composition in cereals, and especially in oatmeal and wheat germ, which actively interferes with the normal development of the teeth. Further, for the production of perfect teeth the diet must contain some calcium and phosphorus. If the diet is rich in vitamin D the amount necessary to produce such teeth may be very small; if the vitamin intake is very low, then extra calcium may effect some improvement in the structures. When butter is the source of calcifying vitamin in the diet, the calcium intake assumes a still more important rôle; without vitamin D perfect calcification will not take place however much calcium and phosphorus is given in the diet. She therefore deprecates the use of the expression "optimum amount" of calcium. Exercise plays little or no part in the development of the teeth in dogs. Exposure to sunlight, however, may result in the formation of good teeth with diets which would otherwise produce somewhat defectively calcified teeth. Proper maternal feeding is of great importance in the production of good teeth in the developing offspring; poorly calcified deciduous teeth can be produced in the litter by feeding the mother on a diet deficient in vitamin D. Nevertheless the defects so produced are less marked than those found in the permanent teeth when the puppy itself is fed on the same diet, owing no doubt to the sacrifice by the maternal organism of her own store of essential substances.

These are the conclusions drawn from the study of dogs at the Sheffield Field Laboratory. They relate only to dogs, but if, Mrs. MELLANBY adds, the experiments described have any significance for the human subject, it would seem likely that the ordinary diet, especially of the poorer classes, in this country will tend to produce imperfect teeth, since vitamin D is either absent from or deficient in bread, rice, oatmeal, barley, sugar, fruits, jam, most vegetables, lean meat of various descriptions, and white fish, articles of diet which form the bulk of the food eaten. The justice of this reasoning from dog to man has been repeatedly challenged by those who hold the view that oral hygiene is the secret of the prevention of dental decay, and that the interaction of food and bacteria in the mouth is the most important factor determining the decay of teeth, but the results considered as a whole fall into line exactly with those obtained by Prof. E. MELLANBY in his work on the calcification of bone in young animals. The remaining parts of the report which are yet to come will deal with the application to the teeth of other animals, including man, of the principles established in the case of the dog. The arena will then be set out for a clash of arms on one of the most vital socio-medical problems of our time. Meanwhile everyone must be grateful to Mrs. MELLANBY for so clear a presentation of a complicated problem.

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WHEN CONDUCT IS INFAMOUS.

WHEN dismissing an appeal a few weeks ago Lord Justice SCRUTTON remarked that it was a pity that the words "infamous conduct" occurred in Section 29 of the Medical Act of 1858 as a ground for removing a practitioner's name from the Medical Register. What the statute meant, said Lord Justice SCRUTTON, was serious misconduct in a professional respect—that is to say, viewed in the light of the rules governing the profession. Towards some such paraphrase, indeed, there has been a demonstrable tendency in recent years. The apothecaries, in their Act of 1874, copied the "infamous conduct" of the Medical Act, but in 1878 the Dentists Act significantly expanded the phrase to "infamous *or disgraceful* conduct in a professional respect." Soon afterwards the Veterinary Surgeons Act dropped the "infamous" and was content with the epithet "disgraceful." The present Architects (Registration) Bill, still awaiting its chance of becoming law, follows the veterinary surgeons' precedent with "any conduct disgraceful to him in a professional respect." This slightly modifies the similar Bill of 1927, which proposed to remove an architect's name from the register on conviction for felony or misdemeanour or on his being judged by the discipline committee after due inquiry to have "conducted himself in a manner derogatory to his professional character." The Engineers Bill a few years ago spoke of "conviction of any henious offence" and "unprofessional conduct of a serious nature." These examples show the tendency to approximate to such language as Lord Justice SCRUTTON has used and to abandon the obsolete implications of infamy.

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[1] Diet and the Teeth: an Experimental Study. Part I.: Dental Structure in Dogs. By May Mellanby. Medical Research Council, Special Report Series. No. 140. H.M. Stationery Office. 1929. 17*s*. 6*d*.

What, after all, is infamous conduct? The history of past centuries gives the answer. Certain crimes were technically infamous—treason, forgery, perjury, and all offences involving the charge of falsehood. Conviction for these crimes disabled a man from being a witness or a juror. A man who thus became infamous was not merely discredited as a witness; he could not give evidence at all, though a pardon could restore his credit and capacity again. Research into these matters takes us back to the Middle Ages. Conviction and judgment in cases of barratry and præmunire, we are told, also led to infamy. In addition conduct might be infamous if it caused a man to be put in the pillory or whipped. Technical distinctions were subtle. At common law the pillory meant infamy, but the civil or canon law took no account of the pillory unless the offence itself was infamous, so that a man could be a good witness to a will in an ecclesiastical court provided that the conduct for which he was pilloried was not infamous according to ecclesiastical ideas. Moreover, if the accused could claim benefit of clergy, accompanied by burning in the hand under the statute of 18 Elizabeth, he escaped the disability of infamy. These anachronisms disappeared about a century ago. Benefit of clergy was abolished in 1827; the pillory was abolished for all offences except perjury in 1816 and for perjury itself in 1837. In 1828 punishment for felony, once it had been endured, was given the effect of a pardon under the great seal, and punishment for any misdemeanour except perjury, once endured, ceased to render a man an incompetent witness; these two provisions almost put an end to infamy. Finally, in 1843, Parliament formally enacted that crime should no longer incapacitate anyone from giving evidence.

These historical details reveal the language of Section 29 of the Medical Act to be some 100 years out of date. Infamous conduct—the conduct that involves infamy—has now no legal significance; its popular meaning is elastic; its interpretation is invidious. To modernise the language by a direct ad hoc amendment of the Medical Act (to give effect to Lord Justice SCRUTTON's paraphrase) might stir up unprofitable controversies. A rewriting of the Medical Acts in consolidated form (a process now being applied to the Solicitors Acts) would offer a better opportunity. Meanwhile it may be remembered that, although "infamous conduct" was inserted in Section 29 in the public interest, it does not fall to the public to interpret the words. Medical practitioners are not in serious doubt as to the conduct to which the words refer, for everyone whose name is placed upon the Register knows what is expected of him.

DIABETES IN CHILDHOOD.

BEFORE insulin came into use juvenile diabetes was universally regarded as a hopeless disease, in which no line of treatment could do more than postpone for a year or two the onset of coma. E. P. JOSLIN, who had treated 169 children between 1914 and 1922, found only one-third of this number alive at the end of the period. The statistics of the Mayo Clinic illustrate how completely insulin has altered the prognosis, for out of 164 cases treated in the clinic since 1923, 147 were alive in 1928. Nevertheless, a case mortality as low as even 10 per cent. in such a series leaves room for improvement, and F. N. ALLAN and R. M. WILDER,[1] in analysing these statistics, have ascertained as far as possible the cause of death in each of the remaining 17 cases. Their findings are instructive. Most of the patients came to the clinic from a distance, afterwards returning to their own medical attendants, and only one of them, a child admitted moribund in diabetic coma, died actually in the clinic. In eight of the remainder insulin either was not used or was suspended owing to ignorance or prejudice on the part of the relatives or doctor; and in four more the disease was allowed to get out of control. Two patients died of intercurrent infectious diseases (encephalitis and influenza), one child proved resistant to insulin, even in large doses, and in the remaining case coma was not recognised at first (owing to defective Benedict's solution), and fatal hypoglycæmia followed the use of too heroic doses of insulin. It is evident from these figures that in the future, as prejudice is overcome and the value of insulin becomes universally recognised, the immediate mortality in juvenile diabetes should be limited to those rare cases in which insulin, even in enormous doses, has no effect on the blood-sugar. Whether insulin will have any effect in reducing the incidence of later complications, such as gangrene and cataract, time alone can show. Meanwhile the lesson furnished by the Rochester statistics should be learnt. Every diabetic child should be treated with insulin and should be regarded as a potentially severe case, even if the response to treatment is immediate. A diet adequate in caloric requirements and containing sufficient protein, accessory food factors, and minerals to allow normal growth, is of course necessary, and the balance between diet and insulin must be varied from time to time as circumstances demand. Ketosis and the conditions which favour its appearance must be watched for vigilantly and treated promptly and thoroughly. Many lives would be saved if it were more widely known that abdominal pain and vomiting are amongst the commonest and earliest symptoms which usher in diabetic coma. If the diagnosis of coma is delayed until the patient is unconscious the most energetic treatment may not infrequently fail to save life. An infectious illness in the diabetic child should never be treated lightly. Not only is the carbohydrate tolerance depressed in many cases by the toxæmia, but the child loses its appetite and is prone to develop a starvation ketosis which very easily merges into diabetic coma. Confronted by such circumstances many practitioners, fearing hypoglycæmia, reduce or suspend the insulin; but if coma is to be avoided the need for insulin is never more imperative than at these crises. Most physicians will agree with F. N. ALLAN's statement that "the need for insulin during sickness, even when no food is taken, is something that everyone should know." *It is, however, inexcusable to allow any diabetic patient to starve during an intercurrent illness.* The glucose equivalent of the diet can, and should always, be given in some easily digested form such as sugar, orange-juice, or milk. The insulin can then be increased if necessary, and the risk of hypoglycæmia and starvation ketosis can be ignored.

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[1] Jour. Amer. Med. Assoc., Jan. 18th, p. 147.

Annotations.

"Ne quid nimis."

WILLIAM ERNEST HEMPSON.

THE death of Mr. William Ernest Hempson, who as solicitor to the Medical Defence Union and later to the British Medical Association was brought for nearly forty years into close association with the medical profession, will be learned with regret by a large number of our readers. He was a Suffolk man, and received his education at Ipswich Grammar School before admission as a solicitor in 1880. He made a fortunate start in his calling by early association with the well-known firm of Freshfields, but some forty years ago he made an independent start and founded the firm now represented by Messrs. Oswald Hempson and Colin Oliver, of which he was senior partner at the time of his death. The number of difficult and delicate situations which were placed before Hempson was very large during his long period of official work, and it was generally admitted that his advice was sound, while his intimate acquaintance with regrettable circumstances involving doctors brought with it no cynicism, but only a keen desire to alter the professional factors which seemed at fault. In 1928 he relinquished the personal appointment of solicitor to the British Medical Association, and his firm was appointed in his place, while in recognition of his many years of work he was elected an honorary member of the Association. He served our calling well, and while the public nature of his duties secured him high respect, there are many individual doctors who will mourn his loss as a friend to whom they had reason to be grateful.

PERFORATING INJURIES OF THE EYEBALL.

IN his Hunterian lecture delivered before the Royal College of Surgeons of England on Feb. 5th, Prof. J. Herbert Fisher strongly advocated the removal of magnetisable foreign bodies from the eyeball by the scleral route, in preference to the more recent method of drawing them into the anterior chamber by means of a giant magnet. With the latter procedure there is considerable risk to both the ciliary body and the lens of injury inflicted by the foreign body during its passage from behind forwards, and, as is well known to ophthalmic surgeons, the ultimate results to vision, when this method is adopted, are not good in the majority of cases. On the other hand, there are two sources of danger which have prevented many surgeons from adopting the method of scleral incision. One is the danger of sepsis, and the other the danger of detached retina which is liable to follow any considerable loss of vitreous. With regard to sepsis, Prof. Fisher pointed out a possible source of infection that is apt to be overlooked. Even where the lacrymal sac has been successfully removed and it is believed that any possible danger of pneumococcic infection from a lacrymal mucocele has been averted, it is still possible for pneumococci to lie hidden in the canaliculi, unless these channels have been cauterised. In one case in which the pathologist had reported the ocular conjunctiva bacteria-free, this had happened with disastrous results. Therefore Prof. Fisher emphasised the wisdom of always completing the operation of excision of the sac by cauterisation of the canaliculi. With regard to the danger of vitreous loss, Prof. Fisher advises insertion of sutures on each side of the line where it is proposed to make the scleral incision before the actual incision is made, so that after the extraction of the foreign body the wound may be closed with the least possible delay. With this precaution the amount of vitreous lost will in all probability be small and even if a limited detachment of the retina does ensue the prognosis is good, contrasting strongly with the bad prognosis inherent to cases of detachment occurring in eyes previously diseased or myopic. Two cases were cited illustrating this point, where reattachment of the retina took place within a comparatively short time, and full vision was retained. A caution was uttered by Prof. Fisher on the necessity of correct interpretation of the X ray skiagrams which are taken with the object of localising the exact position of a foreign body within the eyeball. At one time, even at Moorfields, charts were in use from which it was possible to draw fallacious conclusions in some cases as to whether a foreign body was within or without the scleral coat, and an instance was given in which, if the old chart had been relied on, it would have been concluded that a foreign particle was situated within the eyeball, whereas it was actually lying on the external surface of the sclera whence it was removed without any difficulty. Prof. Fisher further contrasted the sequel of particles of glass remaining within the eyeball, which may be harmless except so far as their mechanical effects go, with the inevitable effects of iron particles causing siderosis and the still more disastrous result of retained particles of copper which lead inexorably to the destruction of the eye. Finally, he referred to the phenomenon of cystic formations of the iris or anterior chamber sometimes caused by perforating wounds which involve the corneal epithelium in their track.

THE TEACHING OF PREVENTIVE MEDICINE.

IT has been said that the medical profession, like the phœnix, is destined to destroy itself in a fire of its own building: its culminating achievement will be the abolition of disease, and with it the practice of medicine as a means of livelihood. Although this magnificent end is still remote, there is nowadays a steady supply of contributions to the funeral pyre, and in this category we may place a book[1] lately received from the United States. At Harvard University it was felt, we are told, that the regular course in preventive medicine was bound by the limited time available to confine itself to the question of the protection of the community as a whole, and that little was taught concerning the protection of the individual. The same probably applies with equal force to the teaching at most English Universities. The student's curriculum—the diminutive is hardly appropriate at the present time—was considered already sufficiently full to make a further addition undesirable. For the last four years the policy has therefore been adopted of inspiring the teaching throughout the course with the spirit of preventive medicine. In this way not only are glimpses given from the first of the way in which the material can eventually be applied in practice, and so the teaching is made more interesting, but also throughout his whole training the student is imbued with the idea of the prevention of disease. Each section is written by the teacher of a particular subject, and sets out the points in prophylaxis that can appropriately be introduced into the lectures. For example, while teaching the anatomy of the perineal muscles one could stress the importance of their proper repair after birth injuries, and the results that may follow neglect. In a volume of small size it is clearly impossible, nor is it intended, to enter in detail into the technique of the measures that are mentioned. The essential object is to put forward the underlying principle, and to illustrate the way in which it may be carried out in the ordinary way of teaching. Twenty special subjects are dealt with—an indication in itself of how subdivided the curriculum has become. The sections devoted to medicine and bacteriology are naturally the longest, for these subjects are most rich in opportunity for the indication of prophylactic measures. The section of surgery includes subdivisions dealing with types of anæsthetic, and points in the pre-operative preparation of patients. The book is definitely written as an experiment, and this, the first edition, is interleaved with blank pages for the insertion of additions and suggestions. The subject matter is very comprehensive and in every way concise and informative, so that practitioners will find much of interest; but in particular it should be read by all who are interested in the teaching of students, because of the original point of view and principle that underlies its production. In these days of specialisation, subjects tend to become multiplied, and teaching consequently becomes divided into separate compartments. Those who instruct in special subjects are naturally absorbed in them, and so are apt to lose sight of the relationship of their specialty to the practice of medicine as a whole. This book marks a definite step in the opposite direction, and an attempt to remedy the defects in the medical curriculum produced by over-specialisation.

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[1] Synopsis of the Practice of Preventive Medicine. Harvard University Press.

THE ADAPTIVE BEHAVIOUR OF BODO.

It is well known that races of bacteria more than usually resistant to a disinfectant may be obtained by cultivating them in dilute solutions of the poisonous substance; that the heat resistance of a bacterium may be increased by breeding from those which survive a heating which kills the majority; that a dose of an arsenical given to a mouse infected with trypansomes may lead to the appearance of a race of parasite which is immune to the drug; and that organisms of the typhoid-*coli* group may "learn" to ferment dulcite or lactose by continually growing in the presence of these substances. The fact of the occurrence of these resistant races, and the facile rapidity with which they may arise are, of course, of the highest practical moment. They would also be of great importance in general biological theory if their interpretation were more certain than it is. On their face value the phenomena look like examples of the direct purposive adaptation which so many biologists have believed in, but which has been so difficult to prove, at any rate to the satisfaction of those whose mental temperament is adverse to such an explanation. And it has always been just possible that they illustrate nothing more than progressive selection. Among the enormous numbers of which an ordinary bacterial population is composed, extreme variants may be expected to occur, and if an ordinary broth culture of the typhoid bacillus included one individual which could eat dulcite it is easy to believe that it would be impossible to make its presence manifest until it and its descendants had been differentially encouraged by a suitable medium. The "arsenic-fast" strains of trypanosomes may well arise in the same way. But it is more difficult to accept this way of looking at the results of the experiments with disinfectants, and especially those with heat; the possibility of growth after a certain amount of heating may be taken to indicate the heat resistance of the most resistant individual of the original strain, and any considerable increase of resistance in the descendants of these survivors is not easy to explain by simple selection. Both technically and theoretically, however, the subject is full of difficulties, and we welcome the contribution to it made by Dr. Muriel Robertson in the last number of *Parasitology* (vol. xxi., p. 375), in her study of the reaction of a free-living flagellate protozoon, called Bodo, to acriflavine. Bodo multiplies by simple fission, and its life-history is not complicated by conjugation or anything like a sexual process: systematically it is related to the trypanosomes. It grows well in pure culture on artificial media, and normal strains occasionally just survive in a concentration of acriflavine as high as 1/5000, though their resistance is usually less. By the progressive subcultivation of the survivors in such experiments, a strain has been obtained which will grow well and continuously in 1/1500 acriflavine, though it cannot survive in 1/1000. If such a resistant strain is cultivated on normal media containing no acriflavine its resistance falls slightly and slowly; it remains far above the normal level for at any rate many months. It seems clear that a heritable modification has been impressed upon the animal, and that the modification is in respect of the feature in the environment which has caused it. Since abundant cultures of bodo can be obtained without much difficulty from single individuals, it is hardly possible to believe that the resistance finally achieved was already present even in one of the original untreated population, with which many concordant experiments were made. Dr. Robertson points out, too, that a culture in a concentration on the border of the lethal limit cannot, as a rule, be subcultivated into the same concentration in the early days of the experiment, while it can be continued into the drug at a later period in the evolution of the survivors. Such a result is unintelligible on the hypothesis of simple selection; it is completely in harmony with the idea of progressive adaptation with which Dr. Robertson herself is in sympathy—as she may well be in Lamarck's centenary year. Acriflavine produces also a curious morphological change in bodo, which in the presence of the drug loses the chromatinic granule at the base of the flagella, known as the parabasal body. This occurs in a proportion of the population (never more than about three-quarters), which depends on the concentration of acriflavine and the resistance of the strain of bodo; a concentration of the drug which produces the maximal number of aparabasal individuals in a normal strain produces hardly any in a resistant strain. The proportion of altered bodo is therefore an anatomical measure of resistance to acriflavine. Arsenic-fast trypanosomes are changed in the same way, which affords an elegant control on the survival experiments to which alone bacteria can be subjected.

MORPHINE AND RENAL FUNCTION.

It has long been taught that morphine should be used with caution in nephritis, and Burney Yeo, speaking of its value in controlling uræmic convulsions, advised sparing administration, lest "the restlessness of uræmia be relieved by the repose of death." The work of Sisk and Beyer, however, went to show that in therapeutic doses morphine has no deleterious effect on the kidney, and R. S. Ackerly,[1] who quotes them, is able to support this opinion from experience of 177 cases of acute and chronic morphia poisoning. In three of these, he says, there were signs and symptoms of nephritis, with abnormal urinary constituents. The remaining 174, who had no symptoms, included 21 with some abnormal constituent in the urine. Of these, four showed albumin, casts, and red blood-cells; 11 albumin and casts; two albumin and red blood-cells; three a trace of albumin only; and one red and white blood-cells. None of these patients had a high blood pressure or œdema. Eleven of them showed some other condition besides morphine poisoning: two were heavy drinkers, one had a stone in the kidney, four had glycosuria, two syphilis, one gonorrhœa, and one optic neuritis with petechial hæmorrhages into the skin. In no case could it be said with certainty that the presence of abnormal urinary constituents was due to morphine, and in all of them the amount of morphine taken was greatly in excess of therapeutic doses. Ackerly advises that "morphine should therefore be used whenever indicated without fear of renal complications secondary to its use." The experiments of Haines and Milliken in 1925, he says, showed that renal function is improved by morphine and atropine in the usual doses, and that morphine given with ether prevents the inhibition of function produced by ether alone.

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[1] Jour. Amer. Med. Assoc., Jan. 11th, p. 79.

STATE BACTERIOLOGY IN CZECHO-SLOVAKIA

SCIENTIFIC work suffered a severe setback in Central Europe during the late war, and in Czecho-Slovakia one of the first tasks of the new Republic was to establish a State Institute of Hygiene, to be associated with the University of Prague. In 1920 the Rockefeller Foundation offered assistance and advice, and plans for the new buildings were prepared; the late Prof. Pavel Kucera became the first Director. The work was to include the production of sera and vaccines, which had hitherto always been imported, and in 1923, though the buildings designed for this section were still incomplete, it was decided that a provisional department should begin work in some laboratories lent by the Institute of Pathology of the University. The experimental animals were quartered in some old farm buildings on the site of the new Institute. During the next two years the members of this section began to prepare vaccines, to form reserves, and to instruct municipal workers. In the autumn of 1925 the new buildings being complete, the department was transferred to them, and the final stages of production—filtering and packing—were begun. Eight months later the first products were on the market, and by the end of 1926 the department was fully established. Since 1927 the activities of the department have proceeded according to plan, and we learn from the first number of its journal[1] they have included the manufacture and distribution of sera and vaccines, and the publication of propaganda on prophylaxis by vaccines and serum immunisation. The demand for the products of the Institute has steadily increased, and additions to the staff have been found necessary to meet it, so that from four workers in 1923 the number has now grown to 42. In spite of the continual claims of routine work, time has been found for research, and one part of the staff is engaged in trying to solve such practical problems in serology as are presented to them. The Institute consists of a two-storied building, designed to keep aseptic and infective work entirely separate; it is equipped with suitable cold-chambers and sterilisers of modern design, and all noisy apparatus is installed in the basement. The laboratories are excellent, and the building is of a size sufficient for the work undertaken, but without useless space. Special "boxes" made of iron, with glass windows, and supplied with filtered air, are used for important work such as the production of vaccines and the inoculation of cultures. The farm is 30 kilometres from the Institute, among wooded surroundings; the delays resulting from this isolation are reduced as much as possible by means of the telephone and motor-car, and the excellent health of the animals is thought to counterbalance other disadvantages. The quarters at the farm are kept clean and well ventilated, and the horses can be turned out to grass when necessary. The staff, including a veterinary surgeon, are accommodated on the premises. Preparation of doses of antigen is performed on the farm in a special laboratory, and a chamber is reserved for injections which are carried out by means of an electric pump. Sterilisation of the finished sera is followed by experiments to test their strength, and by standardisation; in the case of antidiphtheritic and antitetanic serum international units are employed. Tests of sterility are made before and after filling bottles or ampoules, and a written report of all tests is submitted to the chief of the section, who adds his signature to this report only when he has examined it personally. No product is packed until this signature has been added. The sera and vaccines prepared are all those in common use, such as antidiphtheritic, antitetanic, antistreptococcic, antimeningococcic and normal sera, and, among the vaccines, T.A.B., the toxin of the scarlatinal streptococcus and others. The extension of the work will depend on the sales; it has been mentioned that before 1926 all these products were imported, and there is still no duty on foreign sera and vaccines. The members of the Institute have no wish that this should be altered, since they feel it essential that medical men should choose those products they believe to be most efficacious without constraint. A more gradual evolution, moreover, will better suit the convenience of the section at present than a sudden great increase in demand. That the sales of the products of the Institute are rising steadily is shown by the increase in orders noted since 1926.

Since the opening of the section in 1926, propaganda has been distributed widely; all medical men have received copies of price lists, accompanied by brochures explaining the use and value of sero- and vaccino-therapy. Articles on the subject have also appeared in the medical journals, and conferences have been arranged. With the expedition of the work of production it is hoped that further opportunities for research will be given to the staff of the Institute during the coming years.

PROF. BRAILSFORD ROBERTSON AND HIS WORK FOR ANIMAL NUTRITION.

ALONG with the news of his death from pneumonia at the age of 45 comes a copy of a report by Prof. Brailsford Robertson of Adelaide on the work for the past year of the division of animal nutrition of the council for scientific and industrial research of the Commonwealth of Australia. He was a singularly gifted man and one of the liveliest biochemists of his time, widely known outside his immediate circle for his autocatalytic theory of growth which, if it did not meet with universal acceptance in its simplest form, did better for the progress of knowledge by stimulating observation, experiment, and thought on the subject. He was an Adelaide graduate and after 15 years at the universities of California and Toronto he came back as professor of physiology and biochemistry, and everywhere he leaves behind him a trail of students roused by his vivid personality and his enthusiastic imagination. The last few years he had been busy developing research work on sheep and how they live and grow, and this last report gives a most interesting account of the various inquiries which are in hand, especially in connexion with the growth of wool. Horns, hoofs, hair, and wool are largely composed of peculiar proteins which contain a large proportion of the sulphur-containing amino-acid cystine. Animals cannot synthesise cystine, hence the weight of a sheep's fleece may likely be limited by a deficiency of this necessary substance. Ordinary fodder protein contains about 1 per cent. against 13 per cent. in wool. Search has therefore been made for some *available source of protein which is rich in cystine*. Fibrin contains a good deal and meal made from dried blood is possibly useful; yeast also has about 4 per cent. The richest extraneous source, however, seems to be the juices of plants of the rubber-producing trees of the Ficus group and the liquid left after the coagulation and separation of the rubber contains great quantities of cystine, and might in one way or another be made useful. Finally, Prof. Robertson and his colleagues have explored the possibility of rendering the cystine present in the hair, horns, and hoofs of slaughter-house refuse digestible and capable of assimilation by hydrolysing the crude materials with hydrochloric acid, and have obtained promising results with this preparation in field trials.

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[1] Les Travaux de l'Institut d'Hygiène Publique de l'État de Tchécoslovaque, January, 1930.

It is the same idea as was developed by N. Zuntz in Germany during the war to get the maximum yield of wool from the sheep; it was successful at any rate to the point of making one of his co-workers shave twice a day instead of once, and a few years ago a proprietary preparation of hydrolysed keratin was widely advertised for human use. It is indeed evident that what does for sheep will probably do for man, and embarrassed rubber companies may well appear on the hair-restorer market. Other topics of less immediate human interest are the deficiency of phosphates which, as in other countries, is widespread in the soils of Australia, and the demonstration that iodine is present in plenty. The whole report is an admirable example of what can be done by the real biochemist (biologist as well as chemist) and the reading of it can only accentuate our sense of the gap which will be left by the loss of Prof. Robertson at the height of his powers.

THE USE OF PERCAIN.

A NEWLY introduced local anæsthetic, percain,[1] bids fair to be a valuable adjunct to the agents available for producing local analgesia whether by surface application or by injection. Experience so far is too slight for dogmatic assertions, but it certainly warrants the belief that we have here an analgesic of exceptional power, and especially of a long lasting effect. Its superiority over novocain in this respect is maintained by several different observers who are working with it. Some have been using it mainly for the nasal mucous membrane, others for splanchnic and for paravertebral analgesia. All seem to agree on the remarkable duration of the analgesia produced. Experimentally percain has been shown to be about ten times as effective as cocaine. It is also slightly more toxic than this drug, but as it can be used effectively in such very weak concentration there appears to be no danger of toxic effects in practice. So far no reports of ill-effects have reached us, but of course it is too early yet to know whether addiction is to be feared as a consequence of its employment. Percain is sterilisable by heat. It has apparently a slight vasodilator effect, for which reason it is generally used, as is novocain, with small additions of adrenalin, except in situations where vasoconstriction has no special advantage—e.g., in splanchnic and spinal injections.

DELAYED NOTIFICATION OF TUBERCULOSIS.

IT is generally agreed that no public scheme for the treatment of tuberculosis can come into effective operation unless the cases of tuberculosis are reported to the local authority as soon as they come to the knowledge of the practitioner. In his last annual report, Sir George Newman remarks that such notification is becoming more effective year by year, although a proportion of health officers still complain that in a number of cases it is only at a late stage that the disease is first brought to their notice. Under Article V. of the Tuberculosis Regulations the onus is laid on the practitioner to report within 48 hours of becoming aware that any person he is attending is suffering from tuberculosis, unless he has reasonable ground for believing that the case has already been notified. Late notification is no doubt due as often to the delay on the part of the patient in obtaining medical advice as it is to the delay on the part of the practitioner in making and reporting his diagnosis. The Joint Council which acts as a liaison between the various tuberculosis groups has now issued a leaflet of advice on the subject through its hon. secretary at 123, Torquay-road, Paignton, Devon. Notification was introduced 18 years ago, and, while the Council agrees that a wide unofficial discretion has been for the best, it thinks the time has come to recommend practitioners to notify under the following circumstances:—

(1) When suggestive constitutional symptoms are present and sufficient corroborative evidence of tuberculosis is available.

(2) When tubercle bacilli have been found in the sputum or elsewhere.

(3) In cases of hæmoptysis or pleural effusion where other symptoms and signs point to the existence of tuberculosis.

(4) In acute general tuberculosis, and tuberculous meningitis.

(5) In persistent chronic adenitis, arthritis or bone disease, where causes other than tuberculosis can be reasonably excluded.

(6) In tuberculous dermatitis, and lupus vulgaris.

(7) In tuberculosis of the abdomen, of the genito-urinary tract, or of other organs.

In children it is agreed that catarrhal pulmonary infections frequently simulate tuberculous disease, making diagnosis difficult; in chronic adenitis also prolonged observation may be required to determine whether the infection is due to septic organisms or to tuberculosis. Most of the objections to notification arise, it is suggested, from lack of discretion in the visiting of patients, and from the occasional neglect to treat information about tuberculous patients as confidential. It should be made widely known that if the notifying doctor desires that no public health officer should visit the home of the patient, the wish is generally respected. If he does this the practitioner assumes responsibility for seeing that everything possible is being done to limit the spread of infection and to deal with the causation of his patient's breakdown. The practitioner can vitally assist prevention by:

(*a*) Securing the proper disposal of sputum. The easiest way of dealing with sputum or other infective discharge is by boiling or burning. If a cup is used, it should contain disinfectant, and have a non-perforated, removable, or hinged cover.

(*b*) Seeing that an infective patient has a bedroom to himself, or if this is impossible, a bed to himself, separated by at least five feet from any other bed, in a well-ventilated room, and

(*c*) Advising that an infective patient should not handle milk or other foodstuffs, or have the intimate care of young children.

The Council finally reminds the practitioner that the tuberculosis officer is always available for the diagnosis of difficult or doubtful cases, such as unexplained hæmoptysis and for suggestions as to treatment.

CHEMICAL SPERMICIDES.

CONSIDERING the number of spermicides on the market, their wide use, and the sociological consequences of their efficacy, it is indeed remarkable that nobody seems to have directly investigated their effects upon spermatozoa. There is a widespread feeling that existing contraceptive methods are in various ways impracticable by persons of low intelligence, and medical men are often embarrassed by questions from their patients as to which are the best methods. A paper appearing in the current *Journal of Hygiene* (Jan. 20th) will therefore be of widespread interest. Mr. J. R. Baker, D.Phil., has elaborated a technique for testing the comparative spermicidal power of different contraceptives on the market, and also of the various pure substances which constitute the active principles of these preparations. It is an in-vitro technique, and consequently does not reproduce perfectly the conditions of the human vagina, but these are imitated as closely as possible in the matter of temperature and acidity. Dr. Baker's conclusion is that quinine and chinosol, which are common constituents of pessaries, have a surprisingly small spermicidal power. A comparison of their efficacy with that of "semori" and "speton," two German foam-producing pessaries, has shown that one-tenth of a tablet of semori or speton is much more lethal to spermatozoa than is the whole of a quinine or chinosol tablet. Pessaries of quinine and chinosol, in a vehicle of cocoa butter, were found to be ineffective for as long as 12 hours after they had been dissolved and allowed to act upon guinea-pig sperm. That these pessaries have a contraceptive effect of some kind is strongly suggested, however, by a good deal of scattered clinical evidence, and Dr. Baker's work indicates that this effect is probably brought about by a mechanical action of the cocoa butter vehicle, rather than by the chemical action of quinine or chinosol. Further papers on the subject are to follow this one. The work was financed by the Birth Control Investigations Committee, and carried out in the Department of Zoology and Comparative Anatomy at Oxford.

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[1] Obtainable from the Clayton Aniline Co. See THE LANCET, 1929, ii., 1074, 1128, and 1180.

A LONDON SUNLIGHT CLINIC.

THE Institute of Ray Therapy, opened at 152/154, Camden-road, N.W.1, provides treatment for sick and poor persons in London by ray therapy and kindred methods; it is also designed to be a training school for persons qualifying to administer such therapy, and a centre for research. The Institute, which is not allowed by its trust deed to make a profit, was founded with the help of an initial donation of £10,000, and fees will be charged to cover running expenses on the basis of a tariff drawn up with the help of the British Medical Association. Necessitous cases are treated free as well as members of the Hearts of Oak Benefit Society which reimburses the Institute for the treatment of its members. Persons whose income exceeds a stated limit will only be accepted at the special request of their own doctor when reasons are given. In any case the applicant must bring a medical certificate. Treatment is given between 2 and 9 P.M. each weekday by qualified nurses and a resident medical officer working under the direct supervision of Dr. William Beaumont, hon. medical director, who sees new patients (children) on Tuesday, 4 to 5 P.M., (women) on Wednesday, 5 to 7 P.M., and (men) on Thursday, 5 to 7 P.M. The equipment is strictly limited to various kinds of rays, neither massage nor any form of hydrotherapy being included; it is hoped to be able to assess the effect of such treatment in a wide series of disorders such as neurasthenia, rickets, septicæmia, surgical tuberculosis, delayed union of fractures, and various kinds of skin diseases, a list whose scope may be widened by the medical advisory committee which consists of Sir William Hale-White (president), Sir William Hamer (chairman), Prof. J. Eyre, Dr. Beaumont, Dr. P. P. Dalton, and Dr. J. Liddell, the two last being elected by the adjoining divisions of the British Medical Association. Dr. Eyre and Dr. Beaumont are arranging for research on the bacteriological and clinical sides, Dr. N. Lucas of the Lister Institute on the physical and pathological side. Courses of lectures will be given.

GIANT-CELLED SPLENOHEPATOMEGALY.

THE disease first described by Gaucher in 1882, which languished in the medical literature under the vague title of endothelioma of the spleen, has begun to attract more attention now that its ætiology is better understood. The idea of an inborn error of metabolism has been put forward, and biochemical investigations have been stimulated largely by recent descriptions of an allied disorder known as the Niemann-Pick disease. The latter is seen in young infants, and the signs are great enlargement of the abdomen, a curious bronzing of the skin, a raised cholesterol content of the blood, and increasing cachexia leading to death in the first or second year of life. Cells in the spleen, liver, lymphatic glands, and bone-marrow are found to be swollen and to contain lipoid material, as indicated by microscopical stains for fat, and similar cells have been seen in the lungs and thymus. On analysis the spleen contains a great excess of cholesterol and lecithin. This clinical condition can thus be contrasted with Gaucher's disease, which, though it often begins in early life, runs a much more chronic course. The spleen is much more enlarged than the liver, the cholesterol content of the blood is normal, and at necropsy the swollen cells are limited to the spleen, liver, lymphatic glands, and bone-marrow, and do not show the presence of a lipoid by any of the ordinary microscopical staining methods. Differentiation between the two disorders has, however, been made difficult by several recent descriptions of acute forms of Gaucher's disease which caused death in the early months of life. Thus Dr. Eugen Stransky,[1] of Vienna, has described a case where the differential diagnosis between the Gaucher and the Niemann-Pick type of disease was impossible on the evidence obtained. The child was the third in the family, and the two elder ones had succumbed in the first six months of life to an increasing cachexia and intercurrent infection. In the eldest an enlarged spleen and liver were reported at an inquest, while the second child was described as having Gaucher's disease. In Stransky's case death occurred from bronchopneumonia, and no autopsy was permitted. Clinical examination had shown a wasted baby with a curiously bronzed skin, an enlarged abdomen due to a large, hard liver and spleen. A blood count indicated a secondary anæmia, but no leucopenia; the Wassermann reaction was negative, and blood cholesterol normal. The child had head retraction and increased muscular rigidity, and it is interesting to note that nervous complications of the Niemann-Pick disorder have been described. Such a case could well be classed as either an example of the infantile type of Gaucher's disease or as an unusual variety of the Niemann-Pick syndrome. Stransky's point in describing it is to stress the great difficulty of differential diagnosis. It is possible that in Gaucher's disease the cells of the reticulo-endothelial system are swollen with some product of abnormal metabolism, just as they are swollen with cholesterol in the Niemann-Pick disease. Overlapping is likely if both are examples of metabolic errors in early life, and for this reason Stransky suggests that the term giant-celled splenohepatomegaly should be used for the whole group.

ORBITAL INJECTIONS OF ALCOHOL.

FOR some years a few surgeons have made use of orbital injection in certain cases of painful eyes with very little vision, where excision is inadvisable or impracticable, and Dr. L. Weekers,[2] the Belgian ophthalmologist, has recently called attention once more to its value. In painful eyes with only a trace of vision remaining he has injected as much as a cubic centimetre of 80 per cent. alcohol without any manifest injury to the remaining vision, but in cases retaining some useful degree of vision he has been far more cautious, using solutions from 5 to 40 per cent., according to circumstances, after a preliminary injection of 2 per cent. novocain. The usual strength employed is from 20 to 40 per cent., but it is not advisable to exceed this percentage lest the optic nerve should be affected, though this has never happened in his experience. A needle 3·5 cm. long is introduced through the conjunctiva on a level with the external canthus in order to reach the ciliary nerves at the back of the orbit, and if the technique is correct an immediate relief of pain is experienced. Though this may be only temporary, it is none the less valuable, since it may suffice to tide over the time when operative measures can be taken under the most favourable circumstances. Or it may be repeated in a few days or weeks, and sometimes the relief seems to have been permanent. The procedure has been employed for traumatic affections, severe corneal ulcers, herpetic and other painful affections of the cornea, and for iritis. The kind of case in which it may be expected to be most valuable is the acute secondary glaucoma due to cyclitis, where the surgeon is in doubt whether to use mydriatics or miotics, or where it is desirable at any rate to postpone operation though the pain is so excruciating as to be little influenced by hot fomentations and sedatives. In the experience of Dr. Weekers the good effect of the injections has often been immediate and lasting. When it has been otherwise the cause is generally to be attributed to insufficient strength of the alcohol, and there is no reason why the injection *should not be repeated. Besides the relief of pain,* the injection of alcohol into the orbit in cases of absolute glaucoma appears to have a direct influence in bringing down the tension, but apart from these effects its action on the disease itself appears to be nil. In practised hands, however, it can do no harm. There may be a temporary paresis of the external rectus muscle or a temporary œdema of the lids, and there may be temporary loss of sensation in the cornea, but no ill-effects that are permanent are to be anticipated. Its value to patients whose pain is almost unbearable and cannot be otherwise relieved is obvious.

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[1] Jahrb. f. Kinderheilk., January, 1930, p. 204.

[2] Scalpel, Jan. 25th, p. 85.

UNDER the Chadwick Trust a prize and medal may be given once in five years to a medical officer of the Army, Navy, or Air Force whose work has specially assisted in promoting the health of the Service to which he is attached. This prize and medal have just been awarded to Surgeon-Captain Sheldon Francis Dudley, Professor of Pathology and Lecturer in Tropical Diseases at the Royal Naval College, Greenwich, in recognition of his epidemiological research.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Rear Admiral W. L. Martin is placed on the retd. list at own request.

Surg. Capt. W. W. Keir to be Surg. Rear Admiral.

The following appointments are made: Surg. Lt.-Comdrs. (D.) R. J. M. Andrews to *Defiance;* and S. E. Brown to *Tamar,* for R.N. Hospital, Hong-Kong. Surg. Lt. (D.) G. B. F. Reece to *Resource.*

ROYAL ARMY MEDICAL CORPS.

The undermentioned Majs. to be Lt.-Cols.: G. W. W. Ware, vice Lt.-Col. R. C. Wilson to retd. pay; and C. J. Wyatt, vice Lt.-Col. H. St. M. Carter, to half pay.

ROYAL AIR FORCE.

The undermentioned Flying Officers are promoted to the rank of Flight Lt.: B. B. Kennedy, J. Kemp, J. B. Murphy, R. F. MacLatchy, and J. J. Quinlan.

INDIAN MEDICAL SERVICE.

The *London Gazette* for Feb. 7th states that "Officers who are now serving on temporary commissions in the Indian Medical Service and have been gazetted to temporary rank are hereby granted substantive rank on their temporary commissions equivalent to and in substitution for the temporary rank so gazetted, except in the case of temporary rank granted to officers in consequence of their being called upon to perform the duties of a rank higher than their usbstantive rank."

Lts. (T.C.) to be Capts. (T.C.): B. M. Rao, S. K. Menon, A. Singh, and M. Chandra.

Lt.-Col. F. V. O. Beit retires.

DEATHS IN THE SERVICES.

Surgeon Rear Admiral Edgar Ralph Dimsey, D.S.O., who retired in 1920, died on Feb. 5th, aged 68, joined the Royal Navy as surgeon in 1883, and became staff surgeon in 1895. He served in the Benin Expedition of 1887, was mentioned in dispatches, received the D.S.O. and the general African medal with the Benin clasp.

Major-General Sebert Francis St. Davids Green, C.B., C.B.E., R.A.M.C., retd., a graduate of Durham and an old Bart.'s man, died on Feb. 5th, at the age of 62, in the Queen Alexandra's Hospital, Millbank. He joined the A.M.S. in 1894 and served in India. At the outbreak of the late war he went to France with the Rawal Pindi British General Hospital, and in 1915 was appointed to its command, subsequently taking the unit to Mesopotamia. In 1916 he was appointed A.D.M.S. of Amara and A.D.M. of the Base, M.E.F., being mentioned in dispatches four times and created C.B.E. From 1921 to 1924 he was D.D.M.S., Scottish Command, and from 1923, when he was promoted to major-general, to 1927, D.D.M.S., Western Command, India. For some months he was officiating D.M.S. in India, afterwards retiring. He was an hon. physician to the King and was made C.B. in 1925. General Green's wife predeceased him in 1927, and he leaves three sons and two daughters.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LXIII.

THE CLINICAL SIGNIFICANCE OF THE BLOOD PHOSPHORUS.

PHOSPHORUS is found in the blood, not only in the inorganic state, but also in combination with a variety of organic radicles, and in its several forms this element enters into many widely different phases of metabolism. It is not generally realised that less than one-twelfth of the total phosphorus is present as inorganic phosphate. Moreover, the relationship between this fraction and the remaining organically combined phosphorus is so intimate that some knowledge of the latter is essential to the full understanding of phosphorus metabolism. Table I. shows the distribution of phosphorus (P.) in normal blood.

TABLE I.—*Distribution of Phosphorus in Normal Blood.*

—	Phosphorus content as mg. P. per 100 c.cm. in—		
	Whole blood.	Plasma.	Corpuscles.
1. Acid soluble:			
(*a*) Inorganic	3·0	3·0	3·0
(*b*) Organic (ester phosphorus) ..	23·0	0·3	53·0
2. Ether-alcohol soluble (Lipin P.)	12·0	7·0	18·0
Total	38·0	—	—

In addition, traces of phosphorus are present as nucleic acid, in the nuclei of the leucocytes. The nuclein phosphorus is consequently present in some quantity in leukæmia.

Inorganic phosphate.—In health the level of inorganic phosphate in the blood varies between 2·5 and 3·5 mg. P. per cent., the average value being 3·0 mg. After a meal the level falls towards the lower limit of normal, probably as the result of increased secretion of insulin. In children, in whom ossification is more active, higher readings are usual—namely, from 3–4 mg. per cent.—and blood obtained from the umbilical cord at birth may contain as much as 6 mg. per cent.

Acid-soluble organic phosphorus.—This group, which will be referred to as "ester phosphorus," includes a number of phosphoric esters, of which adenine nucleotide, phosphoglyceric acid, and an ester capable of reducing alkaline copper solution (possibly a hexose-phosphoric ester) have been identified. This fraction is confined almost entirely to the corpuscles, but definite traces are found in the plasma. The amount of ester phosphorus in unit volume of corpuscles is one of the most stable constants of normal blood—more stable, for example, even than the hydrogen-ion concentration. An enzyme, *phosphatase,* controls the synthesis of these organic esters from the inorganic phosphate.

The *alcohol-ether-soluble phosphorus* consists of a group of complex lipoids such as lecithin, kephalin, and sphingomyelin. The term "lecithin," commonly applied to this fraction of the blood phosphorus, is misleading; "lipin phosphorus" is more satisfactory. The lipin phosphorus is divided unevenly between plasma and corpuscles. The corpuscular lipin forms with other lipoids a film on the surface of the corpuscle and varies very little either in health or in disease. The plasma lipin, on the other hand, is much more variable and may undergo considerable fluctuations in disease.

Technical Considerations.

Most of the early work on blood phosphate must be accepted with caution, for it was not known before 1914 that the distribution of phosphorus changes when blood is allowed to stand. Once the corpuscles have been laked, the liberated organic esters are very rapidly hydrolysed by the plasma phosphatase and the concentration of inorganic phosphate rises rapidly. Even after precipitation of the protein (which inactivates the enzyme) the phosphate content of the acid filtrate rises appreciably if the solution is allowed to stand at room temperature. Table II. illustrates the extent of this change.

TABLE II.

Blood filtrate.	Inorganic phosphate in mg. per 100 c.cm.	
	At room temp. 16° to 18° C.	At 35° C.
0 hour after precipitation	4·89	4·89
5 hours „ „	5·06	—
24 „ „ „	5·62	6·50
48 „ „ „	5·82	7·10

On the other hand, if the blood is shaken unduly or exposed to air it loses CO_2 and becomes more alkaline; enzyme synthesis now occurs and the phosphate content falls. For this reason serum obtained by defibrination may contain appreciably less phosphate than plasma.

Collection of specimen.—The value of blood phosphorus reports therefore depends on the adoption of rigid technique, and the following precautions should be observed in collecting the specimen. The blood should be collected in a clean *dry* syringe, and transferred to a dry tube containing powdered potassium oxalate (0·015 g. for each 10 c.cm. of blood). The tube should be inverted several times (not shaken) to dissolve the oxalate, and stored on ice. Analysis should be commenced immediately. Heparin must not be used as the anticoagulant, since it contains phosphorus.

Analysis.—The estimation is based on the blue colour which develops when a solution of inorganic phosphate is added to molybdic acid, in the presence of a reducing agent, sodium sulphite, and hydroquinone. The organic extracts are oxidised by combustion with nitric and sulphuric acids into phosphoric acid, which is estimated by the same method. In capable hands the experimental error should not exceed 2 per cent.

Expression of results.—In the interests of uniformity results should be expressed as milligrammes of phosphorus per 100 c.cm. of whole blood or plasma. The use of symbols obsolete in this connexion, such as H_3Po_4 and P_2O_5, leads to much needless confusion.

Physiology.

Sources.—Phosphorus is ingested in the food as nucleoprotein (meat), phosphoprotein (milk), lecithin, &c., (egg yolk, liver), and as inorganic phosphate.

Absorption.—Normal absorption of phosphate from the intestine depends on the balance between the phosphate and calcium of the food, the reaction of the intestinal contents, and the antirachitic vitamin. The influence of these factors will be discussed later in connexion with rickets.

Excretion.—Phosphorus is excreted as phosphate in the urine and fæces.

Function.—Phosphorus enters into the following metabolic processes:—

1. *Carbohydrate metabolism.*—A marked fall in the blood phosphate, accompanied by diminished excretion of phosphate in the urine, follows the injection of insulin. The organic phosphorus remains unaltered, and the fate of the phosphate which, in company with glucose, disappears from circulation is still obscure. L. Harden and W. J. Young have demonstrated the importance of intermediate sugar-phosphate compounds (hexose phosphates) in the fermentation of glucose by yeast, and there can be no question that phosphate is in some way essential to the storage or utilisation of carbohydrate.

2. *Muscular contraction.*—Sugar-phosphate compounds also enter into the chemical changes which precede the contraction of muscle, but here again the nature of the changes is unsettled.

3. *Ossification and calcium metabolism.*—The process of ossification entails the deposition of insoluble calcium phosphate on a framework of osteoid tissue. According to R. Robison a phosphatase, which can be isolated from ossifying bone, is responsible for this process by hydrolysing the organic phosphorus esters and so causing a local concentration of PO_4 ions, which in contact with calcium form an insoluble precipitate of calcium phosphate. The metabolism of phosphorus is closely interwoven with that of calcium, and many of the observed fluctuations in the blood phosphate can be accounted secondary to disturbed calcium metabolism. In general it may be stated that the relationship between the calcium and phosphate ions of the blood is reciprocal; that is, a rise in the calcium leads to a fall in the phosphate and conversely a fall in the former to a rise in the latter. The injection of parathyroid hormone, for example, which increases the blood calcium at the expense of the calcium in the bones, causes a fall in the blood phosphate. This reciprocal relationship is only approximate, however, and breaks down when other factors, such as changes in the pH of the blood or in the absorption of phosphate, enter into the question. Thus in rickets, where the absorption of phosphate is deficient, both the phosphate and the calcium may be subnormal.

4. *Neutrality regulation.*—The nature of the relation between the hydrogen-ion concentration and the phosphate content of the blood involves several conflicting factors. In the first place, alkalosis, by furthering storage of calcium and hypocalcæmia, tends to raise the blood phosphate, while acidosis, by mobilising the stored calcium, has the opposite effect. Secondly, the activity of the plasma phosphatase varies with the reaction of the plasma. Acidosis encourages hydrolysis and a rise in the phosphate at the expense of the organic esters. Alkalosis, on the other hand, favours synthesis and so tends to depress the plasma phosphate. In experimental acidosis induced by ammonium chloride the organic phosphorus esters of the corpuscles are greatly depleted, while the inorganic phosphate rises at first but may fall below normal later. Thirdly, the kidney, by selective elimination of appropriate quantities of the acid and alkaline phosphates of sodium, assists in maintaining the reaction of the blood at a constant level. It is, therefore, impossible to predict the effect of acidosis or alkalosis on the blood phosphate. In practice, however, it is observed that in alkalosis the level is usually raised (up to 5 or 6 mg. per cent.), but in acidosis no constant findings are recorded.[1]

Variations in the Concentration of Inorganic Phosphate.

It will be realised from the foregoing remarks that changes in the concentration of inorganic phosphate in the blood are likely to be encountered in any disease in which one or more of the following factors are altered.

Absorption.—1. Calcium-phosphate ratio of the diet. 2. Reaction of intestinal contents. 3. Antirachitic vitamin.

Excretion.—Activity of the kidneys.

Utilisation and storage.—1. Ossification. 2. Activity of the parathyroid glands (and probably the thyroid

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[1] The terms "alkalosis" and "acidosis" are here used in the exact sense suggested by J. R. Marrack in a previous article of this series (THE LANCET, 1929, ii., pp. 512, 569), and imply an increase or decrease in the plasma bicarbonate. By "ketosis" is meant the presence of acetone bodies in the urine.

The ten mice which were kept alive to study after-effects of the exposure to low oxygen pressure showed definite improvement soon after return to normal oxygen pressure, but six died during the next two months, three probably as the result of accidental exposure to low temperature during severe frost. The remaining four mice were alive ten months later, having apparently recovered completely.

Pathological changes produced by the prolonged breathing of oxygen at 10 per cent. pressure were studied in two mice which died during the experiment, and in nine which were killed for histological examination. The changes observed fully confirmed the conclusion from my previous observations[6] that the chief factor deciding the powers to withstand low oxygen pressure is the heart muscle; a definite sign of heart failure was congestion of the organs, particularly the liver.

The general conclusion from this experiment is that none of the mice maintained normal health after breathing oxygen at 10 per cent. pressure for five weeks; this pressure of oxygen exists at about 20,000 feet altitude. Adverse effects were loss of appetite, loss of weight, and general weakness due to cardiac failure. Nevertheless the resistance exhibited by some few of the animals was of no mean degree.

Experiment 2.—In this experiment the previous result was confirmed, but the main object was to determine whether breathing oxygen at about normal pressure, 20 per cent., for one hour every day would render the animals more resistant to the low oxygen pressure, 10 per cent., and enable them to tolerate this low oxygen tension for a longer period. In this way evidence might be obtained as to whether it is worth while for climbers to breathe oxygen at normal pressure for about an hour every day. There was some evidence in favour of this, but on the whole the advantage gained did not appear very great except perhaps for one or two of the animals.

Two sets of 36 male mice (16–30 g.) were obtained each from a different source—viz., from an Essex stock and from our own stock at the Medical Research Council's farm. Half of the Essex mice and half of the farm mice, that is, 36 in all, were placed in one chamber (gas capacity about 300 litres) and treated as described in the first experiment, being given two weeks to acclimatise gradually to low oxygen pressure, reaching about 10 per cent. on the fourteenth day; they were then exposed continuously to 10 per cent. of oxygen for about four weeks by which time they all revealed inability to maintain normal health. The other half of the Essex mice and of the farm mice were placed in another similar chamber and treated in the same manner, except that they breathed oxygen at 20 per cent. for about an hour every day throughout the whole experiment, and thus had some daily "relief" from the low oxygen pressure.

Both chambers were arranged in exactly the same manner as regards position of cages, soda lime, oxygen supply, and large stirrers for mixing thoroughly the gas within the chamber. The two stirrers were propelled by one motor at a pace sufficient to mix the gas thoroughly in the chambers. The cages were made of fine wire mesh, and each contained six mice. Four small pots with food served for protection, behind each of which two mice could shelter from the moving air if they so desired. The temperature within the chambers varied between 16° to 20° C., fluctuating with that of the room in which the chambers were placed. Soda lime was spread out in dishes at the sides of the chambers and the carbon dioxide in the gas mixture did not exceed 0·20 per cent.

Great care was taken to keep the oxygen pressure similar in the two chambers, analyses of the gas being carried out at least twice a day. During the course of this experiment the barometric changes of the outside air were often sudden and marked, so that the chambers required more attention than usual. The oxygen pressure within the chambers was lowered by passing through them a mixture of oxygen (7–10 per cent.) and nitrogen, both chambers being treated in the same manner. To raise the pressure to 20 per cent. for one hour in the "relief" chamber, this chamber was not opened to the air, but the required amount of pure oxygen was passed through it. The other chamber, termed for brevity "no relief," was ventilated in a similar manner to the "relief" chamber, but with a gas mixture containing oxygen at 10 per cent. pressure.

During the two weeks of acclimatisation the average oxygen pressures within the chambers were 16·0 per cent. and 13·0 per cent. for the "no relief" chamber and 16·4 per cent. and 13·8 per cent. for the "relief" chamber, excluding, of course, the one hour's daily "relief." During the last four weeks of the experiment the average weekly compositions for oxygen were 11·3, 10·0, 10·2, and 10·7 for the "no relief" chamber, and 12·0, 9·9, 9·9, and 9·9 for the "relief" chamber, the lowest daily percentage of oxygen found being just above 9 per cent. in each chamber. There was thus no great difference between the two chambers; the animals in the "relief" chamber had somewhat the lower oxygen pressure.

The main results at the end of the experiment —i.e., at the beginning of the seventh week—are recorded in Table III.

TABLE III.—*Conditions of Mice at End of Experiment.*

—	Receiving "no relief."		Receiving one hour's "relief" daily.	
—	18 Essex mice.	18 farm mice.	18 Essex mice.	18 farm mice.
Alive ..	6	10	16	12
Dead ..	12	8	2	6
Tetany in survivors ..	6 out of 6	10 out of 10	14 out of 16	12 out of 12
Loss of weight in survivors	12 %	22 %	9 %	16 %

As regards deaths, far fewer of the Essex mice died in the "relief" chamber than in the "no relief" chamber, the number of deaths being 2 and 12 respectively; but such a marked difference was not observed in the case of the farm mice, there being eight deaths in the "no relief" chamber and six deaths in the "relief" chamber.

The general conditions of the survivors were compared as regards loss of weight, presence of tetany, and general appearance. All the animals were obviously subnormal; but two of the Essex mice in the "relief" chamber were in fairly good condition and might have tolerated the low oxygen for a longer period; the healthy appearance of the coats of these two mice was maintained, but their movements were somewhat sluggish, although they could climb. All the other survivors showed definite tetany when disturbed, so that the "relief" did not appear to have helped much in this respect. As regards general condition, the "relief" mice lost slightly less weight than the "no relief" mice, both in the case of the Essex and of the farm mice. The farm mice lost more weight than the Essex mice, both in the "relief" and in the "no relief" chambers, but this may have been due merely to the fact that the farm mice were on an average two grammes heavier at the commencement of the experiment; all the mice were young, growing animals and should have gained in weight.

To sum up, then, the "relief" did not exert any great effect upon the result except as regards the number of deaths in the Essex mice and as regards the two fairly healthy Essex mice. It may have helped these two, but it is obvious that the value of breathing oxygen at normal pressure for one hour daily did not appear significant, so that a longer period than one hour would be required.

Summary and Conclusion.

So far as the evidence goes, some rabbits, rats, and mice are more resistant to prolonged exposure to low oxygen pressure than is man. Mice previously acclimatised in some degree cannot maintain normal health after a month's exposure to oxygen at 10 per cent. of an atmosphere (20,000 feet). This agrees with the evidence available from expeditions to very high altitudes. From numerous experiments (see also [6 7]) it was obvious that the most resistant animals deteriorate when exposed for prolonged periods to oxygen pressures about 10 per cent. or under, and there did not appear to be any great difference in this respect between exposure to 10 per cent. (20,000 feet) and 7·5 per cent. (29,000 feet). This is to be expected from the shape of the oxygen dissociation curve, the loss of a given volume per cent. of oxygen from the blood to the tissues at low oxygen pressures in the arterial blood producing not a very great difference between the oxygen tensions within the tissues in the two cases under consideration—namely, whilst breathing oxygen at 10 per cent. and at 7·5 per cent. This was actually demonstrated by measurements of tissue oxygen tensions in acclimatised rabbits.[6] The shorter the time spent below 10 per cent. oxygen pressure in the air (or above 20,000 feet), the less will be the deterioration.

Breathing oxygen at normal pressure (about 20 per cent.) for one hour daily did not greatly increase the resistance of the animals to low oxygen pressure, so that if oxygen is to be used at normal pressure at high altitudes it must be breathed for a longer time than this. This would involve a large increase in transport of oxygen, apparatus, &c. Recent improvements, however, have rendered such apparatus much lighter than formerly.

It is difficult to estimate the powers of resistance to prolonged exposures to these very low oxygen pressures without a severe test. The choice of animals is, of course, more or less haphazard compared with that for climbers. Nevertheless the behaviour of the more resistant animals may with justice be compared with that of the specially selected climbers.

References.

1. Younghusband, Sir F.: The Epic of Mount Everest. London, 1926.
2. Haldane, J. S., Henderson, Y., and Schneider, E. C.: Phil. Trans. Roy. Soc. B., 1913, cciii., 185.
3. Barcroft, J., and others: Ibid., 1923, ccxi., 351.
4. Hingston, R. W. G.: Geograph. Jour., 1925, lxv., 4.
5. de Filippi, F.: Geograph. Jour., 1911, xxxvii., 19.
6. Campbell, J. A.: THE LANCET, 1928, ii., 81.
7. ,, : Jour. Physiol., 1927, lxii., 212; Ibid., 1927, lxiii., 325.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

The Yale Institute of Human Relations.

THE history and development of this Institute is described in a recent address by Prof. M. C. Winternitz, dean of the Yale Medical School. While the medical school was concerned with the early treatment and prevention of mental disorder, Dr. Arthur H. Ruggles was building up a mental hygiene service for the benefit of the 5000 students in the University. Problems of behaviour were also of interest to other departments in the University, such as the department of psychology located in a different part of the city from the medical school. The Dean of the Law School, who as secretary of the University had been associated with the attempt to secure a secretary for the student body, became interested in the study of the causes underlying infractions of the law. He added a psychologist and a sociologist to his staff. So the need for a central institute for the study of man became apparent. Here will be represented biology with its applied sciences of medicine, public health, nursing, and sociology, with its allied law, business, industry, religion, &c. There are to be beds for 50 "guests" at the institute. The guests will include some for whom detention has been prescribed in the interests of society, others from the general wards of the hospital or from the out-patient department, others again will be referred from the Juvenile Court. Some may enter of their own free will. None will come against his own wish. There will be recreational facilities as well as laboratories.

Not only will professors from several different fields meet here to exchange viewpoints and contribute new light to the general problem, but students also in such widely different fields as medicine, law, and business administration will find in the institute a place where their diverse interests overlap.

Training of Negro Doctors.

There are two medical schools in the United States of America devoted exclusively to the training of negro students: Meharry Medical College and Howard University. The capacity of these two schools together is not more than 100 graduates per annum. It is estimated that there were 94 coloured students in the medical schools of the North and West in 1928. This means that at present not more than 120 negro doctors can be supplied yearly. Even so the difficulties of assigning senior students to clinical work in northern hospitals are very great—so great as to have led to the suggestion that they should be transferred to the already crowded schools for negro medical work already referred to. Yet the need for negro physicians is very great, especially in the south. For example, in Tennessee the death-rate among whites for 1927 was 10·2, while that for the negro population was 19·3. In the cities these two rates were respectively 15·3 and 28·8. In public health work it is urged that the negro physician and sanitarian understands the "psychology" of the negro people and can better secure their coöperation than a white health officer.

At the thirty-ninth annual meeting of the Association of American Medical Colleges held recently the following resolution was introduced by Dr. E. P. Lyon, dean of the University of Minnesota Medical School, and was carried unanimously.

> *Resolved:* That the Association of American Medical Colleges recognises the need for better facilities for the education of negro physicians and nurses: that the attention of philanthropic citizens and foundations is directed to the opportunities afforded in the field of negro medical education; and that we particularly call attention to the excellent work being done against great odds at the Howard University Medical School and the Meharry Medical School, and to the many needs of these institutions for buildings, hospital facilities, equipment and endowment.

The two negro colleges are carrying on work of great value under difficulties. Howard University recently completed successfully a drive for a one-half million dollar endowment for its medical school. More than 60 negroes gave $1000 each to this fund. Sixty-one per cent. of the students registered there last year had a baccalaureate degree. A campaign is now under weigh in Chicago for an endowment of three million dollars. A million needed by the University for teaching and research has been given by John D. Rockefeller through the General Education Board. The Provident Hospital, where the nurses and medical students gain their clinical experience, has received a grant of three-quarter million dollars from the Julius Rosenwald Fund. It is hoped to raise the balance of the endowment by public subscription during the present month.

Ultra-violet Solarium for Cornell University.

Dr. Smiley, medical adviser to Cornell University, and Dr. G. H. Maughan, of the department of physiology, have satisfied themselves as the result of experiments carried on over several years that ultra-violet irradiations do inhibit to a considerable extent the development of the common cold. An elaborate solarium equipped with 16 fifty-inch mercury tubes and five carbon arc lamps has been provided. It is said to be the first installation of its kind in an American University.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Marriage Statistics in the Free State.

THE Section of the Report of the Census of the Irish Free State for 1926 dealing with Conjugal Conditions was recently issued. It contains much interesting information. The most striking point is that there is a larger proportion both of unmarried males and of unmarried females in the Irish Free State than in any other country in the world of which figures are available. Of males between 25 and 30 years 80 per cent. are unmarried; between 30 and 35, 62 per cent.; between 35 and 40, 50 per cent.; and between 55 and 65, 26 per cent. Women also marry late, but not so late as men. Of women between 35 and 40 years of age 42 per cent. are unmarried. The percentage of unmarried women at each age-period is approximately three times that in America, and 50 per cent. greater than in England and Wales. The rate is much higher, both for men and women, in rural than in urban areas. Though marriage is late the number of children in proportion to the marriages is high, and has shown almost no change in the past 60 years, while in many countries, including England and Wales, there has been a great falling-off in the numbers. The late marriage age has another effect, in that the number of orphans is unduly high in the Irish Free State. Again, the age of marriage of the male being much higher than that of the female, the number of widows in the Irish Free State is high. It is noted that the more rapidly a population increases the smaller the proportion of old people in the community; while in a decreasing population the proportion is large. In conformity with this general principle it is found that the proportion of people over the age of 65 in the Irish Free State is higher than in any other country the figures for which are available. It follows that an old-age pension scheme is a proportionately heavier burden in Ireland than anywhere else.

The form in which Mr. John Hooper, Director of Statistics, and his colleagues, are issuing the Census Report is deserving of high praise. The facts are plainly set out, and are easy to arrive at.

Dinner of the Royal College of Surgeons.

The Charter Day dinner of the Royal College of Surgeons in Ireland was held last Saturday evening in the College Hall, with the President, Prof. Andrew Fullerton, presiding. The Governor-General of the Free State was the principal guest. The President spoke of the loss the College had sustained by the untimely death of his predecessor, Prof. T. E. Gordon, last July. He paid a sympathetic tribute to Mr. Gordon's work both as surgeon and as teacher. The Governor-General, speaking confidently of the future of the Free State, drew attention to the extensions and improvements that had been made in several of the Dublin hospitals during the past year. His Excellency is much interested in improving facilities for helping the sick, and before reaching his present high position had written on the subject. A pleasing interlude in a pleasant evening was the presentation by the Council of the College of silver cigarette cases to two students of the College School, Dr. Paul Murray and Mr. M. Crowe, who had played in the victorious Irish Rugby Football Team earlier in the day. Dr. Murray had made the score which gave Ireland the victory.

The Tuberculosis Problem.

Dr. P. C. Varrier-Jones, Medical Director of the Papworth Village Settlement, gave an interesting lecture last week before the Women's National Health Association of Ireland, the Governor-General being in the chair. He said that the sanatoriums in England and elsewhere were filled as to two-thirds of their beds with "middle" and advanced cases of disease, with the result that the patients broke down when they got home. If dispensaries were devoted solely to the detection of early cases of tuberculosis, and if sanatoriums were employed for the arrest of these cases, all would be well. They were spending millions a year on the treatment of tuberculosis, but next to nothing on its prevention. Their scheme of sanatorium treatment did not solve the problem of the "middle" cases, and until a suitable environment was provided for these cases the disease would spread. He went on to show that such an environment could be created as had been done at Papworth, and the patients could support themselves by their own labour, and live fairly normal lives. He then gave, with the aid of a lantern, a detailed description of the life and work at Papworth. Further speeches were made in support of the project to establish a settlement on similar lines at Peamount, County Dublin.

Dr. Nicholas Colahan.

Galway has lost a veteran physician and teacher in Dr. Nicholas Whistler Colahan. He took his degree of M.D. of the Queen's University of Ireland as long ago as 1872. In 1877 he was appointed to the chair of materia medica in Queen's College, Galway, his colleague in the chair of medicine being his father, Dr. Nicholas Colahan. Prof. Colahan continued to fulfil the duties of this chair until some two or three years ago. He was also physician to the Galway Union Infirmary and Fever Hospital, and on the staff of the County Galway Hospital. He enjoyed a large private and consulting practice. As teacher in the College he was well known to many generations of the alumni of Galway.

Dr. Garrett Hickey.

Dr. Garrett A. Hickey, who died last week, took the licences of the Royal College of Surgeons and the Apothecaries' Hall in 1890, and spent his whole professional life in New Ross, where he was medical officer to the workhouse hospital and to a dispensary district. He was one of the leading citizens of the town, and was held in much respect and affection by his neighbours. He took an active part in medical affairs, and was for many years one of the leading spirits in the Council of the Irish Medical Association and in the Irish Medical Committee. In these capacities he was well known throughout the whole profession in Ireland, and trusted and respected by all.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Tuberculosis in Vienna.

THE chief medical officer of health, Dr. Goetzl, has lately given an instructive account of the campaign against tuberculosis in Vienna. All the age-groups, he says, show a distinct decline of morbidity, except those aged 50 and upwards. In this group males show a much higher increase than females. The municipal authorities in their campaign depend largely on compulsory notification, and reports of cases discharged from hospital, which can be supervised at welfare centres. In 1927 the insurance organisations were asked to notify to the Austrian Society for Fighting Tuberculosis any infective cases of tuberculosis coming to their knowledge, and as a result of their coöperation, 744 sources of infection were reported in 1928, only a few of them having been under observation by the Society previously. Another means of detecting a focus of infection is by way of an infected child. In the case of 1094 infected children an intradomiciliary source of infection was discovered in 613, and an extradomiciliary source in 150 cases. In 331 cases none could be traced. The list of infectious tuberculous patients in Vienna amounts at present to 5300 persons. Very interesting was Dr. Goetzl's information about the attempts made to improve the housing conditions of infectious patients. In 1928, he said, out of 1272 dwellings, no less than 780 (over 61 per cent.) badly required such improvement. In 342 cases the infectious conditions were removed; in 96 the infectious patient could be permanently taken away, and in 45 the desired object was attained by finding another home for the threatened children. In 22 cases it proved possible to procure a healthy dwelling with a separate bedroom for the patient. A separate bed for the patient, at a satisfactory distance (2 metres) from the other beds was arranged for in 101 cases. It is noteworthy that in 149 cases the patient was refractory to all instructions and refused to take the advice of the medical officer. In some other cases the negative result was due to the impossibility of obtaining a suitable lodging or of sufficiently separating the patient from his family within the home.

Operations on Injured Hearts.

Acting on a suggestion of the celebrated surgeon Eiselsberg, it has become the custom here to demonstrate in the Gesellschaft der Ärzte every case of injury of the heart which has been operated on. Thus at the last meeting Dr. Schey showed two men, on whom he had performed a cardiac operation and gave the details, which were briefly as follows :—

A youth of 18 was brought to the hospital with severe cyanosis and dyspnœa; the radial and carotid pulses were not perceptible, the cardiac sounds were inaudible, and there was no hæmothorax. A stab wound was visible in the fourth intercostal space, and an operation was performed at once (20 minutes after the injury was inflicted). No pulsation was seen on the exposed pericardium, but a small stab was seen on the anterior wall, closed by a clot. The pericardium was opened, the clot was removed, and then the heart began to beat and a profuse bleeding set in. By means of a catgut suture the heart was pulled forward and thus the bleeding wound in the anterior wall of the ventricle was exposed and could be closed with three sutures. But for a pleural empyema of short duration the patient made an uninterrupted recovery, and he has remained healthy ever since.

In a second case, which proved fatal, the symptoms of cardiac injury were so far absent that it was at first doubted whether the heart was damaged at all. There was no shock, no cyanosis, no dyspnœa, and no increase of the cardiac dullness; the murmurs were quite distinct and the pulse normal. But in the next 30 minutes symptoms of a rapid internal hæmorrhage appeared, a diagnosis of pulmonary injury was made, and the thorax was opened. Only then was the cardiac injury found, and it was apparent that the lungs were uninjured. The patient died, 10 hours after operation, from embolism of the brain—a very uncommon complication.

In a third case an unexpected thing happened. At the end of an operation for a stab wound of the heart a needle was dropped into the pericardial cavity and disappeared behind the heart. Only after a prolonged search was it recovered, with the bare hand, having travelled down to the point of origin of the great vessels.

In the discussion following the demonstration, Dr. Popper related his experience of heart surgery. A patient with a revolver injury of the heart showed an entry wound on the left cardiac margin, but the place of exit of the bullet was not found, for the heart suddenly stopped beating when it was pulled forward for examination. The operation was completed without trouble after vigorous massage of the heart. A radiogram, taken after three weeks, showed the bullet situated on the right posterior cardiac wall, just between the two ventricles. The patient made an uneventful recovery with the exception of a slight pneumonia. In another case the patient had four wounds, two of which had penetrated the pericardium, and showed severe symptoms of cardiac hæmorrhage. The main injury was on the tip of the heart and was closed with catgut. This patient also made an uneventful recovery, showing that the surgery of the heart is rapidly becoming a simple matter of routine.

Voronoff's Operation in the Vienna Old Age Asylum.

For about a year several pupils of Dr. S. Voronoff have been experimenting on a few inmates of the Vienna asylum for the aged with the object of ascertaining the efficacy of Voronoff's much-discussed method of rejuvenation. A number of old men were selected, who after careful examination by a neurologist, a physician, and a urologist, were thought fit for the test—that is to say, whose mental and physical condition were such that a good result might be expected. In only one case—a man of 74—has the implantation of testes of a baboon resulted in restoration of mental and physical activity. Six weeks after the operation the patient, who had shown marked signs of senility, was able to resume his work in the garden; the tremor of his hands had disappeared, he felt quite fresh, and even his libido had returned. But the surgeon, Dr. Bachrach, who performed the operation, could not see any of the other evidence of rejuvenation—such as new growth of hair and disappearance of wrinkles—which Voronoff mentions. Even in this solitary favourable case the improvement was not permanent, and some of the troubles of senility soon returned. In the other cases operated on the results were either absent or so slight as to be negligible. In a few men there was a little improvement, which might be attributed to suggestion, but was not maintained at a control examination some months later. Bachrach thinks that the advanced senility of the inmates of the asylum was chiefly responsible for the negative results. The selected patients had no reserve forces, and the presence of such reserves is a sine qua non for the reactivation of manhood. The experiments thus show that only the *ageing* organism is fit for regeneration; when the body is already quite senile, no good results can be expected. But in the other group favourable results are obtainable if we do not hope for too much. So far as is known all evidence of rejuvenation disappears within a few years.

Recent Advances in the Treatment of General Paralysis.

As G.P.I. is a chronic disease with spontaneous remissions, one cannot be sure of real improvement until after prolonged observation of a large series of cases. Treatment with malaria and recurrent fever passes this test, but all the later methods are still on trial. The Vienna school usually augments the specific treatment by adding a course of salvarsan up to 5 grammes. In cases refractory to malaria, and in a relapse after malaria, infection with recurrent fever proves almost as effective. Infection with rat-bite fever is similar but has not yet been adequately tested. The other methods with injection of living organisms into the circulation have proved, in the hands of the Vienna clinicians, quite valueless and even dangerous. Sulfosin (a suspension of 1 per cent. pure sulphur in olive oil) is painful and useless.[1] Intravenous injection of 10 c.cm. of a 20 per cent. solution of sodium chloride (Valinsky) followed by a hot bath and pack, produces fever, but has been tested only in a few cases, and cannot be judged correctly. The same holds good of prolonged hot electric baths (Chvostek). Other experiments have been made with large doses of salvarsan, with tryparsamide (as reported from America), and with phlogetan and sodium nucleinicum. All these have given very little success and have been ineffective in many cases. Whatever treatment is to be given it is essential to secure the earliest possible recognition of this dangerous condition, and this can only be done by laboratory tests. It may be safely assumed that patients with a healthy liquor are rarely if ever in danger of acquiring a metaluetic affection. Therapeutic effort must therefore be directed towards making the liquor normal. So far malaria therapy stands alone as a safe means to this end, the favourable results in early cases reaching as much as 80 per cent. It has been shown that the degree and duration of the fever produced by malaria play an important part.

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[1] Favourable results with sulfosin have been described by K. Schroeder in our columns (1929, ii., 1081).—ED. L.

DONATIONS AND BEQUESTS.—Mr. George Douglas, J.P., of The Bield, Bentinck-drive, Troon, Ayrshire, left £500 each to Broomhill Home for Incurables, Kirkintilloch, the Royal Hospital for Sick Children, Glasgow, the Royal Samaritan Hospital for Women, Glasgow, and Kilmarnock Infirmary.—Mr. David Reuben Sassoon, of Queens-gardens, Hove, among other bequests, left £1500 to King Edward's Hospital Fund; £500 to the Sussex County Hospital; £400 to the Royal Alexandra Hospital for Sick Children; £250 to the Brighton, Hove, and Preston Dispensary, and the Hove Hospital; £100 to the Royal Surgical Aid Society; and £1500 to the Spanish and Portuguese Jews' Hospital.—Mr. Keith Ramsay-Maitland, of Edinburgh and Dunbar, left £500 to the Dunbar and District Hospital; £200 to the Dunbar, Belhaven, and Spott District Nursing Association; and on the expiration of a life-rent, the following legacies: £2000 each to the Royal Infirmary, Edinburgh, and the Royal Edinburgh Hospital for Sick Children; £1000 each to the Convalescent Home, Murrayfield, the Royal Edinburgh Hospital for Incurables, the Royal Blind Asylum and School, Edinburgh, and Queen Victoria's Jubilee Institute for Nurses, Scottish branch.

PSITTACOSIS.

A MEMORANDUM FROM THE MINISTRY OF HEALTH.

A MEMORANDUM on psittacosis has been issued by the Ministry of Health (151/med.), calling attention to the prevalence and characteristics of the disease, the precautionary measures which should be adopted against its spread, and the investigations in progress and contemplated into its ætiology and epidemiology.

Prevalence.

Since July, 1928, some 30 or 40 suspected cases have been brought to notice in England, principally in Cheshire, Warwickshire, and the London district. Numerous cases of human psittacosis have recently come to notice in South America, the United States of America, Germany, Austria, Czecho-Slovakia, and Switzerland.

Characteristics of the Disease.

Acute illness due to infection by parrots has been described from time to time in medical literature since Ritter first called attention to an outbreak in Switzerland in 1879. In England, cases have been recorded by Beddows (1914), Gulland (1924), and Thomson.[1] In general, the disease in human beings takes the form of an illness, usually acute, with typhoidal and pneumonic symptoms. The pulmonary condition varies from a slight bronchial catarrh to massive consolidation of whole lobes of the lung; the "typhoid" symptoms may be severe or consist merely of headache and pyrexia, though frequently epistaxis, rose spots, abdominal distention, and, sometimes, diarrhœa are also present. The illness has frequently lasted many weeks, and in not a few cases has been fatal.

The bacteriology is at present far from clear. *B. psittacosis* isolated from a sick parrot by Nocard in 1892, and by Perry in 1920, was found by Perry to be identical with *B. aertrycke* (Mutton). The presence of this organism has not been established so far in any of the recent English cases, or in the birds associated with them. Quite recent research points to a filtrable virus as the infecting agent of certain of the London cases (THE LANCET, Feb. 1st, 1930, p. 235), though it is as yet too early to say what significance these discoveries have.[2]

Circumstances of Occurrence.

The usual history is that a patient with an illness resembling typhoid, or more rarely with an atypical pneumonia, is found on inquiry to have been in close contact with a sick parrot, parrakeet, or love bird. The incubation period in the person attacked may be as long as ten days. Transmission of the disease from one human case to another has occasionally been suspected but has not been definitely proved. The cases of human illness have mostly been infected by recently imported birds, the conditions favouring the bird disease being overcrowding, fouling of food, water, and cages.

Apparently infection from bird to bird may occur in this country; epidemics are unknown, however, at the Zoological Gardens in London, and even on the premises of bird dealers, where hygienic conditions are less favourable, outbreaks are uncommon. Infection may persist for periods up to four months in an apparently healthy bird.

Precautionary Measures.

There is no ground for apprehending danger from domestic parrots which have been kept in a household for many months or years apart from any introduction of new birds. On the other hand, this cannot be said as confidently in regard to most newly purchased birds, and the public is likely for the present to be chary in buying birds which have recently arrived in this country, or whose history is unknown to the purchaser. This caution is not unreasonable. Persons owning these pets would be wise :—(*a*) to pay attention to strict cleanliness of the cage and protection of food and water from fouling by the birds; (*b*) to scrub and disinfect all articles which have been in contact with sick birds, as well as removing these from contact with healthy birds; (*c*) to avoid fondling and petting newly acquired birds.

Investigations.

Recent cases have been under investigation, especially in and near Birmingham and in London. Medical officers of the Ministry have taken part in certain of these investigations and from their experience note the importance of ascertaining and recording certain points of detail in studying cases. These are :—

(*a*) Nature and period of the association between the human case and the parrot, and the directness of contact likely to convey infection.

(*b*) The history of the bird, so far as it can be ascertained, with dates, particularly including the date of the bird becoming ill.

(*c*) The date of the attack in the patient and the symptoms.

(*d*) Whether there has been any evidence of the association of the patient with previous human cases.

Medical officers of health, besides transmitting information on cases reported to them, can assist by :—

(1) inquiring, in all notified cases of enteric fever or pneumonia, into the possible association of the patient with sick or recently dead birds;

(2) instructing sanitary inspectors and health visitors to be on the look out for illness among pet parrots, budgerigars, &c.;

(3) Unless adequate facilities for research are available or preferred elsewhere, forwarding to the laboratory of the Ministry :—(*a*) bodies of birds which seem to have been connected with cases of human illness; (*b*) portions of liver, spleen, lungs, bone-marrow, and lymph glands, in 50 per cent. sterile glycerin, diluted with normal saline, from fatal human cases where a post-mortem examination has been made. Specimens should be dispatched in conformity with the post office regulations as regards pathological material and addressed to the Ministry of Health Laboratory, Dudley House, Endell-street, London, W.C. 2.

Information regarding cases or suspected cases of psittacosis should be communicated to the Medical Officer of Health of the district, or if desired, direct to the Ministry (Senior Medical Officer (Med. 1)).

DEATH FROM PSITTACOSIS.—At the London Hospital on Feb. 5th an inquest was begun by Deputy Coroner Dr. W. Bentley Purchase upon one of the victims of psittacosis. Mr. Dennis Sullivan, of Barking, said that the deceased, Lilian Rogers, was his sister-in-law. She was 30 years old. The house surgeon at the London Hospital gave evidence that the deceased was admitted on Jan. 28th with her brother Edward. Both were suffering from psittacosis. The other brother, James, was admitted on Jan. 30th with the same illness. The parrot had been bought on Jan. 10th, seemingly ill, and died on Jan. 22nd. When admitted the deceased was comatose and had pneumonia, gradually became worse, and died on Feb. 2nd. The post-mortem examination showed that she appeared to have died of psittacosis. Apart from that she was healthy. Edward had almost identical symptoms and was not yet out of danger. The deceased's brother James was progressing favourably. When this disease was first discovered in 1896 it was thought to be due to the *Bacillus psittacosis*, but this was not brought out by subsequent investigation. There was a recorded case of transmission from one human being to another, with a history of having used the same handkerchief. The disease was not unlike typhoid, with symptoms in the lungs. Dr. Fenton, of Barking, said the parrot was bought on Jan. 10th with two others. One bird went to the Rogers family, one to Romford, and the third to a resident of Stepney. The first two birds were dead, but the Stepney one had been secured by the London Hospital alive, but very ill. The deceased was taken ill on Jan. 23rd and Edward on Jan. 25th. The latter went to bed with a temperature of 102·6° F., suffering from photophobia and severe headache. The Deputy Coroner said this was not an inquiry which he could finish that day. He desired some more information, and adjourned the inquest until March 4th.

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[1] THE LANCET, 1929, ii., 117.

[2] An amplification of the preliminary note published by Dr. Bedson, Dr. Western, and Dr. Levy Simpson in THE LANCET of Feb. 1st will be found on p. 345 of the present issue. Further reference to psittacosis will be found in our Parliamentary Intelligence columns.—ED. L.

Correspondence.

"Audi alteram partem."

RADIUM OR EXCISION FOR EPITHELIOMA OF THE TONGUE.

To the Editor of THE LANCET.

SIR,—Mr. Ogilvie's letter contains a fallacy which appears likely to provide difficulties whenever any attempt is made to compare statistically the results of surgical treatment with those of treatment by radium, in that he does not take into account the operability rate. To compare Regaud's figures, which are based on cases of which only some 20 per cent. were operable when submitted to treatment, with those of surgical excision which were necessarily all operable, is to reduce statistical comparison to the absurd. A further point which appears to me to be of far greater importance than statistics can ever convey is the fact that the patient treated by surgery is necessarily a mutilated patient, the one treated by radium is not. Actually the time has not yet come when statistical comparison between surgery and radium can fruitfully be made, but if we consider the patient as a human being rather than as a unit in a group of figures, then, in the case of cancer of the tongue at any rate, there can be little doubt as to which method has the most to offer him.

I am, Sir, yours faithfully,
E. G. SLESINGER.
Wimpole-street, W., Feb. 9th, 1930.

THE SALE OF WEED-KILLER.

To the Editor of THE LANCET.

SIR,—I wish to direct your attention to a matter of grave importance—it is this: although no lay person can obtain poisons from a chemist without giving his or her name and address, anyone can go to an oil shop and purchase enough weed-killer to end the days of 50 persons without being asked any questions. In the inquest on the Stanley family it was stated that a teaspoonful of weed-killer was a fatal dose, and that mixed with ordinary food it was quite tasteless. What a terrible state of affairs this is, and how unsatisfactory for the medical profession; a doctor cannot know that the patient has taken weed-killer until he has had the vomit analysed, but by that time the patient is dead, so that nothing can be done for him. I trust you will use your influence to have this state of affairs altered as soon as possible.

I am, Sir, yours faithfully,
ERIC CLINE, M.R.C.S. Eng., L.R.C.P. Lond.
Weybridge, Feb. 8th, 1930.

*** Our correspondent rightly draws attention to the perilous ease with which weed-killer can be purchased. The law is not now so vigorous as in the time of Henry VIII. when, after a deplorable incident in the Bishop of Rochester's household, Parliament imposed on persons found guilty of wilful poisoning the penalty of being boiled to death. Nowadays, in spite of restrictions on the sale and possession of poisons and "dangerous drugs," a would-be murderer can easily equip himself with a tin of the right stuff at an oil store. The Arsenic Act of 1851 is still upon the statute-book, but Section 2 of the Poisons and Pharmacy Act of 1908 seems more anxious to encourage the sale of sheep-dip and weed-killer than to protect His Majesty's lieges from being poisoned. The Section provides that sale is to be under licence of the local authority and subject to regulations. It is commonly said that local authorities take these responsibilities lightly and that the few formalities required by the regulations are neither widely known nor invariably observed. Facilities for buying sheep-dip and weed-killer are commercially desirable, but are there no prospects of non-poisonous preparations being produced which will satisfy the requirements of farmer or gardener? Quite apart from statute, there is a common-law duty of persons who possess poisons to take good care that they are so securely kept as not to be a source of injury to others. If it be true that weed-killer is sometimes sold to minors or others without adequate inquiry, it would seem that this common-law duty is not discharged.—ED. L.

BERI-BERI IN A WHALING EXPEDITION.

To the Editor of THE LANCET.

SIR,—I was much interested in your annotation (p. 250) on Dr. Nissen's experience of beri-beri in an antarctic whaling expedition. During the 1927–28 season I was in the antarctic as medical officer on a whaling ship and was called on several occasions to other ships to see cases of beri-beri. I had with me a very limited quantity of marmite which I gave in small quantities to these cases. The improvement shown in the few days prior to the men being sent to the base was so striking that I put in a strong recommendation to the company that in future all their ships should have an adequate supply of marmite on board, to be used for the prophylaxis of beri-beri. This has, I believe, been done with excellent results.

I am, Sir, yours faithfully,
Edinburgh, Feb. 5th, 1930. JOHN B. ROLT, M.B.

SPINAL ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—Dr. Howard Jones says the explanation of the escape of the phrenic motor roots when numbness in the neck follows a novocain injection is simple; and he suggests that it is as follows:—

> "(1) The upper remnant of a heavy solution tends to affect the posterior roots more than the anterior."

Quite so, but I am using a lighter solution. Clouds of witnesses will testify to this. They have seen the cerebro-spinal fluid as it comes into the syringe drop by drop fall to the bottom leaving the spinocain or May and Baker's solution at the top. The tendency therefore would be for it to affect the anterior roots.

> "(2) The concentration in the cervical region is too dilute to affect motor fibres."

A few months ago I saw a patient unconscious, analgesic from head to foot, and pulseless, whom the surgeon declared to be dead—not only dead, but that he smelt dead (this was partially true, for he had four feet of completely gangrenous gut inside the abdomen)—whom I declared to be alive, simply on the grounds that he was breathing regularly, albeit quietly. This ground proved to be solid rock, and he recovered. Here, then, apparently Dr. Jones and I are agreed, that the concentration in the cervical region is too dilute to affect the motor fibres. But the concentration used was amply sufficient for all operative procedures. In other words, in the concentration commonly used and necessary, novocain paralyses receptors, leaving the phrenic motor roots, nerves, and diaphragm active.

One case is not enough, so let me quote Jonesco, who, using mostly stovaine, but also novocain, records 1387 cases which he injected "au dessous de la proéminente," with successful analgesia without fatality. Here again the concentration in the cervical region was too dilute to affect the motor fibres—for all these patients must have breathed. The paper of Koster and Kasman, to which you referred in your issue of Jan. 18th (p. 145), shows that novocain will not paralyse the phrenics; it does not offer any explanation of the paralysis of the abdominal muscles. I think it is a fair inference from their paper to suppose that in the strength used novocain paralyses abdominal muscles merely by cutting off afferent impulses. In any case I am not sure that the explanation is as simple as Dr. Jones suggests.

The matter is one of great importance. The present objection, and a very real one, to spinal analgesia for upper abdominal surgery, is due to the fact that manipulation of viscera sets up afferent impulses in the vagus. These impulses always cause more or less distress; usually the distress can be borne, it depends on the patient. If we could safely anæsthetise the vagus, there would be no more objection to spinal analgesia for upper abdominal work than there is now for (say) a hernia, or the amputation of a toe. Consciousness is hardly an objection. If it could be definitely established that novocain paralysed receptors only in a strength which would produce complete analgesia, the problem would be solved. Jonesco, Kasman, and Koster seem to have done it.

I am, Sir, yours faithfully,

Manchester, Feb. 11th, 1930. E. FALKNER HILL.

CO_2 FOR PULMONARY AERATION.

To the Editor of THE LANCET.

SIR,—May I call attention to what is presumably a slip in Dr. Fuller's article on Post-operative Pulmonary Complications in THE LANCET of Jan. 18th (p. 121)? If " 50 per cent. CO_2 in air " was actually given, it is hardly surprising that patients would not tolerate it, for 5–10 per cent. is the concentration commonly employed, and it is very doubtful if higher concentrations could be tolerated by conscious persons for any length of time.

I am, Sir, yours faithfully,

R. J. CLAUSEN.

Clifton Hill, St. John's Wood, N.W., Feb. 2nd, 1930.

A FACTORY CLINIC.

To the Editor of THE LANCET.

SIR,—The opening early this spring of a factory clinic in the Swiss mountains for certain victims of tuberculosis coincides so nearly with the publication of last year's preliminary vital statistics that one may be forgiven for suggesting that the Ministry of Health might do worse than explore the possibilities of the Swiss idea for adaptation amongst ourselves.

At Leysin, 4500 feet above sea-level, there is now being completed, under the direction of Europe's most eminent practitioner of sun healing, Dr. Auguste Rollier, a series of open verandah workshops several stories high. All the beds are provided with work-tables and special apparatus to allow the patients, who are surgical cases, to work in any position required for their cure. Here in the open sunlight, or, when the cold winds come, behind vita-glass windows letting in the natural ultra-violet rays, they will turn out watches, stockings, pottery, speedometers for aeroplanes and motors and other products, all at the usual industrial rates. I am told that the work for some time to come has already been contracted for.

If we mean to mend the grave situation disclosed by last year's figures for births and deaths, in which the part of the white scourge must have been dire, here surely is an agency full of hope not less from the point of view of prevention than from that of actual cure.

I am, Sir, yours faithfully,

House of Commons, Feb. 10th, 1930. H. H. LAWRIE.

HALIFAX INFIRMARY.—Last year this hospital treated 4114 in-patients. Their average stay was 17·6 days, a minute fractional increase upon the figure of the preceding year. Each one cost £5 5*s.* 11*d.*, as against £5 3*s.* 6*d.* in 1928; the cost per occupied bed was £130 1*s.* 2*d.*—in the preceding year it was £129 6*s.* 7*d.* The maternity cases numbered 360, and 340 children were born. Motor accidents treated numbered 120; they cost £1300, and occupied ten beds during the whole of the year—one patient was admitted in June, 1928. Workpeople's contributions reached the high-water mark of £9659.

Obituary.

JOHN WRIGHT MASON, M.B.E., M.B. ABERD., D.P.H.

THE death of Dr. Wright Mason, in his seventy-eighth year, leaves a gap in the ranks of the pioneers of sanitation in this country. It is now nearly 50 years since he was appointed medical officer of health for Hull—now the city of Kingston-upon-Hull—and under his guidance the department which he controlled grew from almost a single-handed affair to one containing some 600 persons. He took a keen interest in all developments of public health work—though he had misgivings about the wisdom of some of its more recent advances—and his knowledge of infectious diseases and what is now called environmental hygiene was unsurpassed. He had dealt with cholera, plague, and serious small-pox epidemics, and he was responsible for the erection of one of the finest disinfecting and contact stations in the country. His chief loves were, however, medico-legal work and port sanitation. Until a few months of his retirement in 1925, he acted, single-handed, as police surgeon to a force of some 1000 men: he took a daily sick parade and spent much time visiting sick policemen in their homes. He had a wonderful collection of specimens from cases of medico-legal importance, and an honour which he esteemed highly was that of Examiner in Forensic Medicine in the University of Edinburgh. He was an authority on port sanitation, was one of the founders, and for some 30 years the honorary secretary and treasurer of the Association of Port Sanitary Authorities of the British Isles. He was always too busy to have many hobbies, but he took a great interest in the Volunteer movement, Freemasonry, and the collection of old armour. He resigned his public offices in March, 1925, and was the recipient of many gifts. His wife predeceased him by two years. He lost a son in the war, and is survived by four sons and a married daughter.

JOHN KEKWICK, M.R.C.S. ENG., L.D.S.

Mr. John Kekwick, whose death occurred on Jan. 27th, was a Carlisle man, and succeeded to a practice which had been founded by his father, and carried on by his uncle. He was educated at the Middlesex and Royal Dental Hospitals, being house surgeon at the latter hospital after qualifying in 1891. His practice was a very extensive one, his name being well known and much respected throughout the Border Counties. He held the position of dental surgeon to the Cumberland Infirmary from 1899 to 1911, and returned again in 1914, at the outbreak of the late war, when the hospital staff was depleted by war service. An active member of the North of England Odontological Society and British Dental Association, he retired from practice only six months ago, after a long illness, but for some years he had made his home in the country. He was an enthusiastic gardener, the countryside always appealed to him, and he had many friends amongst the agricultural community. He leaves a widow and three sons, of whom the second is a medical student at Cambridge.

" ABUSING " THE NAME OF A HOSPITAL.—In deciding to support a contributory scheme for the benefit of the Warneford Hospital, the Leamington Chamber of Trade protested against what was described as the " abuse " of the name of the hospital by organisers of entertainments on its behalf, who inundated the members with request for gifts towards whist-drives, &c. These very numerous entertainments last year produced only £204 for the hospital. It was stated that a large proportion of the proceeds was swallowed up by expenses and that balance-sheets were not sent to the hospital. It was decided to make representations to the hospital committee on the subject, it being thought that every entertainment in aid of the funds should be officially sanctioned.

Parliamentary Intelligence.

HOUSE OF LORDS.

WEDNESDAY, FEB. 5TH.

PSITTACOSIS.

The Earl of **ONSLOW** asked the Government how many cases of psittacosis or "parrot disease" had been recorded since June 1st, 1929; what steps had been taken to prevent the spread of the disease, and whether there were any restrictions imposed on the importations of parrots, and, if so, of what nature?

Lord **DAWSON** said he desired for a few minutes, before the answer was given on behalf of the Government, to draw attention to a few facts. He did not do so in any critical spirit, because the present health administration of the country had rightfully the confidence of the public. This was not really a new disease. It was a disease which had been known for some time, but it was new in this respect that it had recently become a matter of some anxiety in certain districts of England. There was no fear of it becoming rapidly diffused, like influenza. It would not spread in that universal way, but it would spread in patches. It was a disease which broke out among small communities of people and families, but in the patches where it did appear they were liable to get a mortality which was very depressing. He would illustrate that by this instance. A boy bought a parrot a little while ago—because the incubation period was anything from ten days to three weeks—and it was noticed by his mother that the parrot was not very well. The mother attended to the parrot and cleansed the bird's eyes. The bird died, and a daughter who had never had any contact with the parrot during its life, took the body and deposited it in the dustbin. The girl who had removed the body of the parrot died after a week's illness, and at the present time the mother and two sons were gravely ill from the disease. That was apt to give a very serious importance to this disease, because it was liable when it did break out to have somewhat dire results. On the other hand, it did not carry with it any necessary anticipation of a widespread epidemic like influenza.

It was mainly the parrots of South America which were responsible for the disease. Some months ago 500 parrots were dispatched from Argentina to France. Some 200 of them died en route, and the presumption was that the remaining 300 were not desirable visitors to the French Republic, for the result of their being landed was that France had an outbreak of this disease; and Argentina itself had an outbreak last July. It seemed that there were two courses open for consideration. Of course the Ministry of Health knew the difficulties of each of them better than other people. One was to put the parrots into quarantine. There always was a lighter side even to serious happenings. He pictured a quarantine of parrots. He hoped they would be in some *remote island, like Lundy* Island, because they would provide serious entertainment for those who survived. If they were to put on to that island certain members of His Majesty's Forces they would find that those who survived had a knowledge of language which would make them highly saleable when this epidemic had passed. The alternative to that was an embargo. He *knew that that* was a dangerous word to those who used it in a political sense. But they had to put an embargo on diseased meat, and animals which were likely to be diseased when they were killed, and *he suggested for the* consideration of the Government whether seeing that a parrot was, after all, a luxury, and that now, if the parrots arrived in this country, the public would put them out into the streets, as they had been doing frequently already, it was not almost better to put an embargo on the importation of these parrots for a reasonable time till the disease was past. He thought that the mere announcement by the Government that they were going to introduce an embargo would probably put a stop, for the time being, to their dispatch here from Argentina. In view of the experience of 500 parrots being dispatched to France, 200 of which had died en route, they were really unnecessarily spreading a disease unless they took action. He thought that it was very important that no alarm should arise over this question, beyond what was proper and fitting.

Lord **MARLEY**, replying for the Government, said that he was sure that the House would welcome the intervention of Lord Dawson who was able to speak with such authority on this matter. The noble lord had paid a tribute to the work of the Ministry of Health which he was sure their Lordships would agree was well deserved. In the first place psittacosis was not compulsorily notifiable, and consequently they had no complete records of the disease. Since June 1st last the Ministry had received information of 40 cases in this country, in some of which the available particulars established only a suspicion of the disease. The Ministry were advised that the danger of the spread of the disease from human contact was practically negligible. If there were, for example, no parrot in a house the occupants of that house would appear to be safe. To deal with the spread of the disease, therefore, they had to rely upon precautions adopted with regard to the parrot itself. The Ministry were advised that the matter might become serious; they had therefore prepared a memorandum setting forth such information as was available with regard to the disease and the precautions which should be observed in the care and handling of parrots. The memorandum would be circulated shortly to local authorities and would be on sale. There were at present no restrictions on the importation of parrots. He did not think that any member of H.M. Forces would welcome being placed on Lundy Island with imported parrots, and he was not quite certain to which—the parrots or the members of H.M. Forces—Lord Dawson had referred when he said that they would learn bad language. But he (Lord Marley) was advised that under the existing law restrictions could only be imposed if it were established that measures were necessary *in* order to prevent the spread of the disease. The Ministry of Health felt that further information was necessary before they would be justified on grounds of health in imposing restrictions on importations. They were further informed that practically no commercial consignments of parrots reached the country *during the winter months.*

HOUSE OF COMMONS.

WEDNESDAY, FEB. 5TH.

Medical Examinations for Entrance into the Navy.

Mr. W. G. **HALL** asked the First Lord of the Admiralty if he was aware that boys who had passed the educational test and two medical examinations for entry into the Navy were liable to rejection by a third medical examination on entry; and if he would see that the first medical test was made more thorough in order to avoid expense to parents and disappointment to boys.—Mr. **AMMON** replied: I assume my hon. friend is referring to boy artificers. These boys frequently volunteer to undergo a preliminary medical examination some time before taking the educational test. Those who pass this educational test undergo an official medical examination for entry into the Service which is normally final. But those who join after a lapse of 14 days or more are again medically examined on arrival in their ship or establishment.

Deaths from Dangerous Drugs.

Major **CARVER** asked the Home Secretary whether, in view of the statement of one of the British assessors at the recent meeting of the League advisory committee on the traffic in opium and other narcotic drugs to the effect that the destruction of life caused by this traffic could be compared with that of a modern battle, he could give any statistics showing what the mortality was in this country from drugs.—Mr. **CLYNES** replied: I have seen a Press report of the remarks made by the President of the Central Opium Board. They obviously related to the world traffic in drugs rather than to the state of affairs in any one country. The Registrar-General has furnished me with the following figures relating to deaths from drugs coming within the Dangerous Drugs Acts in England and Wales, 1921–1928:—

	M.	F.	Total.
A. *Deaths from Opium and other Narcotic Drugs.*—In 8 cases (6 m. and 2 f.) death was due to "the drug habit" or the use of narcotics, but there is no information available to show whether the drugs used came within the provisions of the Dangerous Drugs Acts	18	15	33
B. *Deaths from Suicide by Opium and other Narcotic Drugs.*—In 10 cases (7 m. and 3 f.) death was due to the use of narcotics or opiates, but there is no information available to show whether the drugs used came within the provisions of the Dangerous Drugs Acts	57	22	79
C. *Accidental Deaths from Opium and other Narcotic Drugs.*—In 9 cases (5 m. and 4 f.) death was due to narcotics or opiates, but there is no information available to show whether the drugs came within the provisions of the Dangerous Drugs Acts	64	31	95
Homicide by other Means.—Morphia	—	1	—

THURSDAY, FEB. 6TH.

Prevention of Bovine Tuberculosis.

Lieut.-Colonel **FREMANTLE** asked the Minister of Health if, with a view to effective coördination of effort to prevent

Information as to the number of schemes which have started is not available.

Drinking of "Red Biddy" in Scotland.

Mr. McELWEE asked the Secretary of State for Scotland whether he was aware of the damage to health caused by an intoxicant known as "red biddy" among the industrial population in the West of Scotland; and whether he would cause an investigation to be made thereon.—Mr. ADAMSON replied: I am informed that an alcoholic concoction commonly known as "red biddy" is being increasingly consumed in the poorer areas in certain districts. I am advised that it has a most serious effect on the health of the consumer, and am having the matter fully inquired into.

Medical News.

UNIVERSITY OF CAMBRIDGE.—On Feb. 8th the following degrees were conferred:—

M.B. & B.Chir.—G. N. Wood.
B.Chir.—J. R. Peacock and S. R. Matthews.

UNIVERSITY OF DUBLIN.—The Diploma in Gynæcology and Obstetrics has been awarded to Dr. Chua Boon Teck.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—As the result of the Final Examination held from Jan. 6th to 29th the following candidates were approved in the undermentioned subjects, but are not eligible for diplomas:—

Pathology.—E. S. Asiedu-Ofei, Birmingham; H. B. Bagshaw, London; J. H. Bartlett, Cambridge and St. Mary's; Ilma B. S. Bingemann, St. Mary's; M. Bloom, Manchester; B. F. M. Bond, Westminster; W. D. Coltart and A. F. Davy, St. Bart.'s; P. T. L. Day, Guy's; C. M. Dell, St. Thomas's; P. G. Dowdell and D. G. Evans, Univ. Coll.; J. D. J. Freeman, St. Thomas's; K. H. Gaskell, Cambridge and King's Coll.; G. H. Gool, Guy's; J. O. Harrison, St. Bart.'s; Florence R. Hart, King's Coll.; D. S. Hayes, St. Bart.'s; A. R. C. Higham, St. George's; H. L. Hodgkinson, St. Bart.'s; H. R. Hovsha, King's Coll.; E. B. Jackson, Univ. Coll.; L. Jacobson, Cape and London; J. E. Jones, Liverpool; G. C. Knight, St. Bart.'s; S. R. Ledger, King's Coll.; E. H. W. Lyle, Cambridge and King's Coll.; F. G. Maitland, St. Mary's; Gladys L. Neill, King's Coll.; A. M. Nussbrecher, Middlesex; T. C. Outred, Guy's; M. Phillips, London; J. H. Pierre, St. Bart.'s; N. H. L. Ridley, Cambridge and St. Thomas's; R. S. Risk, St. Bart.'s; M. A. Robertson, Cambridge and London; K. M. Ross, St. Bart.'s; B. Rubinsky, London; C. K. Simpson, Guy's; H. Simpson, Manchester; D. J. R. Steen, Cambridge and St. Thomas's; M. R. Thomas, Univ. Coll.; G. M. Tickler, King's Coll.; D. Trimble, Birmingham; and Rose E. Williams, Royal Free.

Medicine.—S. Bochenek, St. Bart.'s; J. Britanischski, London; Amy C. E. Clarke, Oxford and Univ. Coll.; A. F. H. Coke, St. Mary's; Charlotte A. G. Conway, Royal Free; J. H. Conyers, Cambridge and St. Thomas's; H. Coorland, St. Bart.'s; Catherine B. Crane, Royal Free; R. M. S. Cross, Cambridge and St. Bart.'s; Elizabeth T. Davies, Cardiff and Westminster; P. G. Dowdell, Univ. Coll.; Margaret L. Foxwell, Manchester; G. H. Gool, Guy's; P. R. Graves, St. Thomas's; J. T. P. Handy, Univ. Coll.; Eileen E. Harvey, Royal Free; J. R. Hindmarsh, Durham; A. D. H. Hugo, Cape and Guy's; J. E. S. MacDonald, London; Joyce MacInnes and Margery L. Maltby, Royal Free; M. Mandelstam, St. Bart.'s; C. B. Melville, Melbourne and Middlesex; A. M. Nussbrecher, Middlesex; D. D. Payne, St. Thomas's; M. Phillips, London; S. Ramanathan, Ceylon and King's Coll.; N. H. L. Ridley, Cambridge and St. Thomas's; R. S. Risk, St. Bart.'s; C. G. Roberts, Cambridge and Westminster; H. E. W. Roberton, Cambridge and St. Bart.'s; J. M. Robertson, Guy's; L. Seaton, Leeds; T. Shahani, Bombay; L. Silman and S. Silman, Leeds; J. G. Sleigh, Cambridge and King's Coll.; B. Southwell, Guy's; Enid C. Street, Punjab and Royal Free; T. F. Tierney, St. Bart.'s; W. N. P. Wakeley, King's Coll.; Mary J. Westall, Royal Free; G. P. B. Whitwell, Guy's; D. A. Williams, Cardiff and Univ. Coll.; and T. C. Wilson, Birmingham.

Surgery.—K. Alman-Vtcherachnia, Royal Free; Kathleen W. Aylwin-Gibson, Liverpool and Westminster; G. N. Bailey and W. I. Bain, Cambridge and St. Thomas's; G. Balasuriya, Ceylon and Guy's; A. N. Barker, St. Thomas's; C. O. Barnes, Cambridge and St. Bart.'s; F. Bartholomew, St. Thomas's; W. L. H. L. Bell, St. George's; A. Buch, St. Mary's; A. Burkhardt, Univ. Coll.; M. L. Bynoe, King's Coll.; H. M. Chappel, Cambridge and Univ. Coll.; L. P. Clarke, St. George's; A. L. Climer, St. Bart.'s; J. H. Conyers, Cambridge and St. Thomas's; R. V. S. Cooper, Birmingham; T. R. S. Cormack, Cambridge and London; W. C. Cresdee, St. George's; W. J. D'Rosario, Guy's; R. H. Dobbs, London, J. J. Eapen, Madras and Birmingham; R. E. M. Fawcett, St. Bart.'s; F. H. H. Finlaison and R. H. Fish, Cambridge and St. Thomas's; J. D. J. Freeman, St. Thomas's; K. Ghosh, Royal Free; R. W. Graham-Campbell, Cambridge and St. Bart.'s; C. A. Grant, Cambridge and St. George's; E. R. Greathead, Cambridge and London; Rachel Gubbay, Punjab and Royal Free; S. R. Gunewardene, Ceylon and Univ. Coll.; C. J. K. Hamilton, Cambridge and Liverpool; R. M. Harvey, London; D. S. Hayes, St. Bart.'s; Geraldine J. G. Hayes, Manchester and Charing Cross; H. L. Hodgkinson, St. Bart.'s; W. Holdsworth, Liverpool; Laura M. Hollingworth, Univ. Coll.; U. M. Hopkins, Bristol; B. Horwitz and L. H. Howells, London; N. R. Jeffery, Manchester; E. N. Jenkinson, St. Bart.'s; H. B. John, St. Mary's; W. J. Johnson, Guy's; M. M. St. G. Johnstone, Cambridge and St. Thomas's; Alison F. Z. Judd, Royal Free; J. D. Kershaw, Univ. Coll.; F. P. L. Lander, Middlesex; D. H. LeGood, St. Thomas's; H. Lwow, Vienna and St. George's; W. McKissock, St. George's; F. G. Maitland, R. W. Malim, and C. E. P. Markby, Cambridge and St. Thomas's; J. H. G. Mason, Middlesex; Blodwen Morgan, Charing Cross; B. B. Nanavatty, Bombay and Royal Free; P. M. Oxley, St. Bart.'s; G. H Pearce, Univ. Coll.; F. E. Pilkington, Cambridge and King's Coll.; J. O. Poynton, Cambridge and Charing Cross; G. E. Ranawake, Ceylon and Middlesex; A. H. T. Robb-Smith, St. Bart.'s; Victoria M. Robinson, Oxford and King's Coll.; C. A. Rumball, Guy's; M. H. Shah, Punjab and Univ. Coll.; W. W. Simkins, St. Mary's; Edith M. P. Smith, Charing Cross; N. Solomon, St. Bart.'s; R. W. Stephenson, Guy's; A. El K. Talkhan, Cairo; F. H. Taylor, Durham; J. C. G. Whitelaw, Cambridge and St. Thomas's; H. W. Williamson, Cambridge and St. Bart.'s; W. E. Wimberger, Birmingham; F. S. Winton, Cambridge and St George's; F. J. Wright, Cambridge and London; and W. Young, St. Mary's.

Midwifery.—E. F. Adams, Manchester; N. W. Alexander, Cambridge and St. Thomas's; M. Ata Ullah, Charing Cross; F. G. Badger, Cardiff and London; H. B. Bagshaw, London; G. N. Bailey, St. Thomas's; I. E. Banner, Royal Free; C. O. Barnes, Cambridge and St. Bart.'s; C. R. G. Barrington, Univ. Coll.; G. P. Barua, Calcutta and London; D. A. Beattie, St. Bart.'s; J. H. Beilby, St. Thomas's; G. A. Betts, Birmingham; A. Bhardwaj, Guy's; Ilma B. S. Bingemann, St. Mary's; A. T. Blair, St. Bart'.s; B. F. M. Bond, Westminster; P. Brown, London; W. D. T. Brunyate, Oxford and St. Bart.'s; C. R. Caffry, London; G. F. Carey, St. Thomas's; J. Carlton, Guy's; H. T. Chilton, Birmingham; Amy C. E. Clarke, Oxford and Univ. Coll.; R. T. V. Clarke, Oxford and St. Bart.'s; E. C. Coaker, Oxford and St. Mary's; W. D. Coltart, St. Bart.'s; Margaret E. Cook, Royal Free; H. F. G. Corfield, Bristol; F. H. J. Crawford, Liverpool; S. D. de Silva, Ceylon and Univ. Coll.; J. A. Doherty, Durham and Univ. Coll.: W. S. Dyson, Cambridge and Manchester; D. G. Evans, Univ. Coll.; Lena Finkelstein, Charing Cross; F. H. H. Finlaison, R. H. Fish, and E. D. Forster, Cambridge and St. Thomas's; H. R. Fosbery, Middlesex; A. C. Fraser, Cambridge and St. Bart.'s; Lorna M. A. Goulden Bach, Westminster; Mabel E. Grace, Royal Free; C. A. Grant, Cambridge and St. George's; S. R. Gunewardena. Ceylon and Univ. Coll.; G. Hale, Cambridge and St. Thomas's; H. C. Halge, St. Mary's; F. R. T. Hancock, Cambridge and St. Bart.'s; Florence R. Hart, King's Coll.; Eileen E. Harvey, Royal Free; J. Henry, Leeds; A. R. C. Higham, St. George's; F. T. J. Hobday, St. Bart.'s; U. M. Hopkins, Bristol; K. T. Hosain, Punjab; L. H. Howells, London; K. N. Irvine, Oxford and St. Thomas's; O. Ive, Guy's; J. L. S. James, Bristol; G. H. Jennings, Cambridge and St. Mary's; H. B. John, St. Mary's; E. Johnson, Manchester; G. W. Kendrick, St. Thomas's; C. J. King-Turner, Oxford and St. George's; G. C. Knight, St. Bart.'s; J. P. F. Lloyd, Birmingham; A. H. Loudoun, St. Thomas's; H. Lwow, St. George's; D. G. Macdonald, Cambridge and London; A. P. McEldowney, St. Thomas's; Joyce MacInnes, Royal Free; W. McKissock, St. George's; Moyra Macnaughton-Jones, Royal Free; J. D. McVean, Cambridge and Manchester; J. B. Marshall, St. Mary's; C. B. Melville, Melbourne and Middlesex; Blodwen Morgan, Charing Cross; D. K. Mulvany, King's Coll.; Emilata Nawal Kishore, Bombay and Royal Free; Gladys L. Neill, King's Coll.; K. I. Nicholls, Bristol; A. M. Nussbrecher, Middlesex; C. G. Owen, Edinburgh and St. Mary's; R. O. Payne, Guy's; J. H. Pierre, St. Bart.'s; N. S. Plummer, Guy's; E. H. Protheroe Smith, Birmingham; A. Rafla, Cairo; S. Ramadas, Bombay and St. George's; L. Rees, St. Thomas's; Louise Rees, Charing Cross; V. H. Riddell, Cambridge and St. George's; S. L. Rikhye, Lahore; C. G. Roberts, Cambridge and Westminster; D. M. Roberts and B. Rubinsky, London; C. R. Sadler, St. Thomas's; A. R. Sahy, Edinburgh; J. Sakula, Middlesex; L. Seaton, Leeds; T. Shahani, Bombay; Edna F. Sheridan, King's Coll.: H. H. S. Sherwill, Manchester; L. Silman, Leeds; Phyllis F. L. Simon, Royal Free; S. Smith, London; Winifred M. H. Smythe, St. Mary's; G. H. G. Southwell-Sander, R. S. Stacey, and D. J. R. Steen, Cambridge and St. Thomas's; R. W. Stephenson and G. V. Steward, Guy's; J. G. Stewart, Westminster; Enid C. Street, Royal Free; H. M. Strover, Bristol; Mary Sutcliffe, Cambridge and Leeds; A. El K, Talkhan, Cairo; F. H. Taylor, Durham; J. W. P. Thompson, St. Thomas's; O. T. Wade, Leeds; H. Walton, Cambridge and Manchester; E. C. Watson, St. Mary's; J. H. Way, Leeds; Clara E. Wetherall, Royal Free; J. C. G. Whitelaw, Cambridge and St. Thomas's; G. P. B; Whitwell, Guy's; T. C. Williams, Cardiff and Univ. Coll.; T. C. Wilson, Birmingham; and G. R. H. Wrangham and W. Young, St. Mary's.

THE Conservator of the Wellcome Historical Medical Museum (54, Wigmore-street, London, W.1) informs us that "in connection with the anniversary of Galen's birth (A.D. 130) a small exhibition has been prepared" at the Museum.

Royal College of Physicians of Edinburgh.—At a meeting of the College on Feb. 4th, with Sir Norman Walker, the President, in the chair, Dr. Roy Mackenzie Stewart and Dr. William Malcolm McAlister were introduced and took their seats as Fellows. Dr. John Henry Douglas Webster, Dr. Arthur Oliver Gray, Dr. David Pieter Marais, Dr. Sydney Watson Smith, and Dr. James Kirkwood Slater were elected to the Fellowship.

Dr. David Rorie was appointed Dr. Alexander Black Lecturer for 1930.

The College arranged to send a message of congratulation to the Royal College of Physicians and Surgeons of Canada on its erection.

Industrial Health Education Society.—Sir William Haldane will take the chair at the annual meeting of this Society, to be held at the British Medical Association's House in Tavistock-square, London, W.C., at 4 P.M. on Tuesday next, Feb. 18th.

Post-graduate Courses in Berlin.—Besides the regular programme of the post-graduate study a series of special courses will be held in Berlin during March and October. Particulars may be had from the information bureau of the Kaiserin Friedrich-Haus (Berlin N.W.6, Luisenplatz, 2–4), which offers help in procuring suitable lodgings and in arranging attendance at clinics.

Prizes and Grants for Otological Research.—The Council of the Royal Society of Medicine has accepted the sum of £1000 presented by Mr. Norman Gamble for the purpose of providing a prize of £50 every fourth year for original work in otology, the balance of the fund to be used for grants in aid of research. The prize is open to any British subject, whether lay or medical, and applications for the prize and for grants must be received by the Secretary of the Society at 1, Wimpole-street, London, W. 1, not later than Sept. 30th.

1st and 2nd London Sanitary Companies R.A.M.C. (T.F.).—The first reunion dinner, since the end of the late war, of the 1st and 2nd London Sanitary Companies of the Territorial Force was held on Feb. 8th, at the Imperial Hotel. Major Goddard, who commanded the 2nd London Sanitary Company at the outbreak of war, presided over a gathering of more than 300 former officers and men. The guest of the evening was Major-General Sir Wilfred Beveridge, who was the Deputy Director-General, Sanitation, at General Headquarters for the greater part of the war in France, and was therefore the officer responsible for the work of the sanitary sections manned by the two sanitary companies. In responding to the toast of the Guests, Sir Wilfred gave an interesting account of the part played by the sanitary companies in the war. He reminded his hearers that in the original Expeditionary Force no provision was made for sanitary sections, though there was personnel trained in water duties. The two London sanitary companies formed part of the Territorial Force at the commencement of war and had an establishment of six officers and about 150 men in each company. Very soon it was found that there was urgent need in France of men trained in sanitary work, and the sanitary companies were enlarged so as to form a reserve from which officers and men could be sent out to the various theatres of war. The first sanitary section, consisting of one officer and 25 men with full equipment, was sent out in October and was stationed at Rouen. General Beveridge soon found that similiar sections were needed for work with the Divisions, and 12 sections were sent out to France in December from the two sanitary companies and were posted to various Divisions. From this time there was a steady stream of sanitary sections until each Division had its own section, while others were posted on the line of communication. Sanitary sections were also sent to Gallipoli, Italy, Salonica, and Africa. By the end of the war nearly 300 sanitary sections were in being. It was a remarkable tribute to the efficiency of the original companies that it was possible to train such a large personnel of officers and men throughout the whole course of the war. The work of the sanitary section, said Sir Wilfred, was of the utmost value and could not be overpraised. It had been estimated that an army could not afford a wastage from disease and sickness of more than 0·3 per cent. That this figure was rarely reached and scarcely ever exceeded was largely due to the work of the sanitary sections in the field. Major Goddard proposed the health of the Old Comrades of the Sanitary Companies. This toast was responded to by Prof. R. J. S. McDowall, who was in charge of a section during the war. The toast of Absent Comrades was proposed by Major Martin, of the 2nd London Sanitary Company, and responded to by Mr. Manser, a former staff-sergeant, who was chiefly responsible for the arduous task of getting in touch with the former officers and men and for arranging the dinner.

At the quarterly meeting of the directors of the Naval Medical Compassionate Fund on Jan. 22nd, with Surgeon Vice-Admiral Arthur Gaskell in the chair, the sum of £120 was distributed among the several applicants.

Health Conference and Exhibition in Greece.—The first Panhellenic Health Conference will be held in Athens in April and will be followed by an international exhibition of social and individual hygiene from May 1st to July 31st. Exhibits from abroad should arrive before March 31st. The headquarters of the organising committee are in the offices of the Medical Association of Athens, Odos Kriezotou, 1.

Medical Tour in Spain.—A second tour for medical men to the hydromineral and climatic stations of Spain has been arranged for Easter. The party will leave Barcelona by special motor boat on April 13th, visiting Palma (Majorca), Alicante, Malaga, Seville (in time for the celebrated Good Friday procession), and Valencia, returning to Barcelona on April 23rd. There will be an opportunity of seeing the exhibitions at Barcelona and Seville. Further information may be had from Dr. Mañeru, Ronda de Conde Duque, 4, Madrid.

National Council for Mental Hygiene.—A series of lecture-discussions on Mental Health and the Child will be delivered at 11, Chandos-street, Cavendish-square, London, W., on Wednesdays, at 5 P.M. The subjects and lecturers are as follows: The New Psychology and the Parent, by Dr. Hugh Crichton-Miller (Feb. 26th); the Child and the Teacher, by Dr. Letitia Fairfield (March 5th); the Delinquent Child, by Mr. W. Clarke Hall (12th); the Difficult Child at Home and at School, by Dr. William Moodie (19th); Sex Education, by Mrs. Neville-Rolfe (26th); and Choosing a Career, by Dr. R. D. Gillespie (April 2nd). Tickets may be had from the Secretary of the Council, 78, Chandos House, Palmer-street, S.W.1, or at the doors.

Enlargement of Cameron Hospital, West Hartlepool.—The Prince of Wales is being asked to lay the foundation stone of a children's ward to be added to this institution, when he presently visits West Hartlepool. A new radiological block is to be added at the same time.

Tramwaymen and Hospitals.—Of the 8000 tramwaymen in Manchester nearly 6000 are contributing to the local hospitals through a fund started a little over a year ago. Deductions of from 2*d.* to 5*d.* a week are made from their wages, and last year £3201 was thus raised. The contributors and their families are entitled to hospital treatment, and there are no administrative expenses.

Study of Medical Hydrology.—The Committee for the Study of Medical Hydrology in Great Britain informs us that it can arrange for lectures, on medical hydrology and spa treatment, to senior medical students, post-graduate associations, and medical societies. It is also prepared to arrange for visits of such associations to any of the British spas and to give lecture-demonstrations. Further particulars may be had from the hon. secretary, Dr. Geoffrey Holmes, 11, Ripon-road, Harrogate.

The Bath Hospitals.—The Bath Royal United Hospital is to be transferred to Combe Park at a cost of £100,000, in addition to £30,000 to be paid by the corporation for the existing buildings, which it is intended to convert into a technical college. Mr. A. Stanley Wills, of Bath, has given £10,000 towards the amount required.—Lady Stothert has opened two sitting-rooms for the use of patients in the Forbes-Fraser Hospital as a memorial to her husband, the late Sir Percy Stothert, who was chairman of the hospital.

Western Infirmary, Glasgow.—The annual report records an ordinary income of £72,639, and an expenditure which left a deficit of £9665, an improvement upon the £12,337 deficit of the preceding year. There were 15,521 in-patients and 38,437 out-patients, a total increase of 3615. The average period of residence was 18·18 days, as against 20·05 days in 1928, and the average cost per patient was £6 14*s.* 8*d.*, as compared with £7 18*s.* 3*d.* in the preceding year. After deducting patients who died within 48 hours of admission, the death-rate was 5·1 per cent. The means for providing an ophthalmic department have been in hand since 1916, but owing to the continuance of the Rent Restrictions Act it has not been possible to clear the site, which is occupied by tenements belonging to the Infirmary. The new X ray and electrical department is nearing completion, and is expected to be in full working order within the next three months.

BIDEFORD HOSPITAL.—In this small hospital the average cost per occupied bed fell last year from £2 3s. per week to £2 0*s.* 9*d.* Administration cost 3·40 per cent.

BRADFORD HOSPITAL AND CONVALESCENT FUND.—For the sixth successive year this Fund is allocating £20,000 to the City's hospitals and institutions. In the last 25 years £292,000 have thus been provided.

A BRICK HOSPITAL IN THE "GRANITE CITY."—The possibility that the new Joint Hospitals at Foresterhill, may be built of brick instead of the native granite, is causing an animated discussion in Aberdeen. The buildings, instead of costing £400,000 as originally estimated, are now expected to cost half a million at least, and it is understood that the governing body of the Royal Infirmary has therefore been considering the possibility of reducing the amount by building in brick instead of stone. On the one hand, it is argued that every mason in North and East Scotland is already occupied, and that a granite building would progress very slowly owing to the scarcity of labour; on the other hand, bricklayers are said to be even scarcer than masons and men would have to be tempted from England and southern Scotland by the offer of higher wages which would swallow up economies, which, it is represented would, in any event, be very small.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Feb. 18th.—5.30 P.M., GENERAL MEETING OF FELLOWS. Ballot for election to the Fellowship. 8 P.M., PATHOLOGY. Communications: E. R. Cullinan: A Case of Tuberculosis of the Stomach. A. Fleming and I. H. McLean: The Occurrence of Influenza Bacilli in the Mouth. T. H. C. Benians: Treatment of Cases of Acute Osteo-myelitis with Benzol, with the Object of Diminishing the Leucocytosis. W. W. C. Topley: Antibodies in Rabbits. Demonstration: W. G. Barnard: Hæmangeioma of the Cerebrum.

THURSDAY.—5 P.M., DERMATOLOGY. (Cases at 4 P.M.). Dr. H. MacCormac: 1. Morphœa Type of Tuberculide. Dr. H. C. Semon: 2. Leukæmia Cutis. Mr. A. Dickson Wright (introduced by Dr. Graham Little): 3. The Treatment of Varicose Ulcer. Dr. G. B. Dowling: 4. Case for Diagnosis. Dr. W. J. O'Donovan: 5. Poikilodermia of Civatte. Dr. R. T. Brain (for Dr. W. J. O'Donovan): 6. Hodgkin's Disease with Cutaneous Nodules. Other cases will be shown.

FRIDAY.—5 P.M., BALNEOLOGY AND CLIMATOLOGY. Discussion on Bath Reaction in Spa Treatment. Opener: Dr. J. Barnes Burt. 8 P.M., OBSTETRICS, ELECTRO-THERAPEUTICS. Special Discussion on The Position of Radium in the Treatment of Gynæcological Conditions. Openers: Mr. Malcolm Donaldson and Mr. Stanley Dodd, Obstetrics; Dr. A. E. Hayward Pinch and Dr. J. E. A. Lynham, Electro-Therapeutics.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, Feb. 17th.—9 P.M., Sir John Thomson-Walker: Enlarged Prostate and Prostatectomy. (First Lettsomian Lecture.)

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, W.

THURSDAY, Feb. 20th.—8.15 P.M., preceded by a Demonstration at 7 45 P.M., Dr. V. B. Wigglesworth: Some Notes on the Physiology of Insects related to Human Disease.

CHELSEA CLINICAL SOCIETY.

TUESDAY, Feb. 18th.—7.30 P.M., Dinner at the Hotel Rembrandt, Thurloe-place, W., followed by a discussion on Defæcation. Dr. Harold Pritchard and Mr. Ivor Back will begin the discussion.

SOCIETY OF MEDICAL OFFICERS OF HEALTH, 1, Upper Montague-street, W.C.

FRIDAY, Feb. 21st.—5 P.M., Dr. R. Veitch Clark, Dr. A. J. Shinnie, and Dr. V. T. Thierens: The Medical Officer of Health in Relation to Housing and Housing Procedure.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Field's, W.C. (Arris and Gale Lectures).

MONDAY, Feb. 17th.—5 P.M., Mr. R. H. O. B. Robinson: The Rôle of Short Circuit Operations in the Treatment of Cholecystitis.

WEDNESDAY.—5 P.M., Mr. W. McAdam Eccles: Anatomy, Orthodox and Heterodox, in Relation to Surgery.

FRIDAY.—Mr. E. R. Flint: The Association Between Gall-bladder Lesions and Hepatitis in the Human Subject.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Feb. 17th to SATURDAY, Feb. 22nd.—MEDICAL SOCIETY, Lecture Room, 11, Chandos-street, Cavendish-square, W., Tues., 4 P.M., Dr. Thomas Tennent: Malaria Treatment of General Paralysis. No fee.—ST. MARY'S HOSPITAL, Paddington, W. Wed., 3 P.M., Dr. C. M. Wilson (Special cases and Out-patients). No fee.—CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C. Wed., 2 P.M. Mr. C. Gill-Carey: Selected Operations on the Ear, Nose, and Throat. No fee.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Special Course in Gynæcology, lectures and demonstrations in the operating theatres. Second week.—HOSPITAL FOR TROPICAL DISEASES, 25, Gordon-street, W.C. Post-graduate course. Tues. and Thurs. afternoons at 2 P.M.—BETHLEM ROYAL HOSPITAL, S.E. Tues. and Sat., 11 A.M., Lecture-demonstrations, Psychological Medicine.—Further particulars from the Fellowship of Medicine.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark Hill, S.E.

THURSDAY, Feb. 20th.—9 P.M., Sir John Thomson-Walker: Enlargement of the Prostate and Its Treatment.

NATIONAL HOSPITAL POST-GRADUATE COURSE, Queen-square, W.C.

MONDAY, Feb. 17th.—12 noon., Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-Patient Clinic. 3.30 P.M., Mr. Leslie Paton: The Control of Ocular Movements.

TUESDAY.—2 P.M., Dr. Walshe: Out-Patient Clinic. 3.30 P.M., Dr. Critchley: Central Disorders of Vision.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-Patient Clinic. 3.30 P.M., Mr. Just: Demonstration of Methods of Testing the Eighth Nerve.

FRIDAY.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-Patient Clinic. 3.30 P.M., Mr. Elmquist: Demonstration of Re-educative Exercises.

ROYAL NORTHERN HOSPITAL, Holloway.

WEDNESDAY, Feb. 19th.—3.15 P.M. (at the Royal Chest Hospital), Dr. J. Maxwell: Treatment of Asthma.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

MONDAY, Feb. 17th.—1.30 P.M., The Mouth and Pharynx.

WEDNESDAY.—1.30 P.M., The Larynx.

FRIDAY.—4 P.M., Mr. C. Gill-Carey: Foreign Bodies in the Food and Air Passages.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, Balham, S.W.

WEDNESDAY, Feb. 19th.—4 P.M., Dr. Arthur H. Douthwaite: The Treatment of Osteo-Arthritis and Rheumatoid Arthritis.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Feb. 17th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases. Clinics. Operations.

BRITISH INSTITUTE OF RADIOLOGY, 32, Welbeck-street, W.

THURSDAY, Feb. 20th.—8.30 P.M. (in the Reid-Knox Memorial Hall of the Institute), Dr. A. E. Barclay: Mechanism of Swallowing. Mr. J. Preston Maxwell: Osteomalacia and Fœtal Rickets. Dr. John Muir: The Irritable Colon.

FRIDAY.—4 P.M., Medical Committee. Reports on cases of gastro-intestinal conditions are especially requested for this meeting, but other cases of interest will also be welcome.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Feb. 18th.—5 P.M., Dr. G. B. Dowling: Staphylococcal Infections.

THURSDAY.—5 P.M., Dr. I. Muende: Pathology Demonstration.

ST. MARY'S HOSPITALS, Manchester.

FRIDAY, Feb. 21st.—4.15 P.M. (at the Whitworth-street West Branch), Post-graduate Lecture, Dr. D. Dougal: Genital Prolapse.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

TUESDAY, Feb. 18th.—3.30 P.M. (at the Jessop Hospital), Mr. Chisholm: Consideration of the Report of Departmental Council on Training and Employment of Midwives.

FRIDAY.—3.30 (at the Royal Infirmary), Mr. E. F. Finch: Renal Tumours.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

WEDNESDAY, Feb. 19th.—4.15 P.M. (at the Royal Maternity and Women's Hospital), Prof. J. H. Munro Kerr: Obstetrical Cases.

Appointments.

Lawrie, J. H. D., M.D. Edin., D.P.H., has been appointed Medical Officer of Health for Macclesfield.

Logan, J. S., M.B., Ch.B.Liverp., Deputy Medical Officer of Health for Swindon.

Essex County Hospital, Colchester: **Wirth**, M.D. Malta, Hon. Surgeon, and **Reid**, M.B., Ch.B. Aberd., Hon. Asst. Surgeon.

Certifying Surgeons under the Factory and Workshop Acts: **Hilton**, M. J., M.B., M.S.Durh. (Camberwell); and **O'Donnell**, G. P., M.B., B.Ch. N.U.I. (Redruth).

Vacancies.

For further information refer to the advertisement columns.

Abergele Sanatorium, North Wales.—Temporary Med. Supt. 15 gns. a week.
Accrington, Victoria Hospital.—H.S. £150.
Bath, Royal United Hospital.—H.S. At rate of £150.
Bedford County Hospital.—H.S. At rate of £175.
Birkenhead General Hospital.—Sen. H.S. and H.P. At rate of £150 and £100 respectively.
Birmingham City and University, Joint Board of Research for Mental Disease.—Histological Asst. £4 weekly.
Birmingham General Hospital.—H.P. and H.S. Each £70.
Birmingham University.—Asst. Lecturer and Demonstrator in Anatomy. £300.
Bootle Borough Hospital.—Hon. Laryngologist and Aurist.
Bradford Royal Eye and Ear Hospital.—Jun. H.S. £150.
Bradford, St. Luke's Municipal General Hospital.—H.P.'s. and H.S.'s. Each at rate of £200.
British Red Cross Society, Clinic for Rheumatism, Regent's Park.—Clin. Pathologist (part-time). £250.
Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.
Cardiff Royal Infirmary.—H.S. to Ophth. Dept. At rate of £75.
Carlisle, Cumberland Infirmary.—H.P. Also H.S. to Special Depts. Each at rate of £155. Also H.S. At rate of £175.
Carlisle, Cumberland and Westmorland Mental Hospital.—Deputy Med. Supt. £500.
Charing Cross Hospital, W.C.—Med. Reg. £150. Obst. Reg. £100. Also Registrar to Ear, Nose, and Throat Dept. £100.
Chester Royal Infirmary.—H.S. £150.
Chiswick Hospital, The Mall, Chiswick.—Hon. Deputy Anæsthetist.
Dartford, Kent, Darenth Training Colony.—Med. Supt. £1000.
Derby, Derbyshire Education Committee.—Asst. School M.O. £600.
Dewsbury County Borough.—Deputy School M.O., &c. £600.
Doncaster Royal Infirmary.—Third H.S. At rate of £150.
Dreadnought Hospital, Greenwich.—Phys.-in-charge of Out-Patients.
Durham C.C.—Deputy County M.O.H. £1000.
East Ham Memorial Hospital, Shrewsbury-road, E.—Hon. Asst. Ophth. S. Also Res. M.O. At rate of £200.
Evelina Hospital for Children, Southwark, S.E.—Hon. Surgeon to Out-patients.
Gloucester County and City Mental Hospitals.—Med. Supt. £1100.
Golden-square Throat, Nose, and Ear Hospital.—H.S. £100.
Gravesend and North Kent Hospital.—Jun. H.S. £100.
Great Yarmouth General Hospital.—Sen. H.S. £150.
Halifax Corporation Isolation Hospital.—Res. M.O. £350.
Hertford County Hospital.—Res. Surg. O. At rate of £250.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S. and H.P. Each at rate of £100.
Hull Royal Infirmary.—Cas. H.S. At rate of £130.
Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £150.
Kent County Council.—Asst. M.O., &c. £600.
Kent Education Committee.—Dental Surgeon. £500.
Larbert, Stirling District Mental Hospital.—Jun. Asst. M.O. £300.
Leicester, City Mental Hospital, Humberstone.—Third Asst. M.O., &c. £500.
Leicester Royal Infirmary.—H.S.'s. and H.P.'s. Each at rate of £125.
Liverpool, Royal Babies Hospital, Woolton.—Res. M.O. At rate of £90.
Liverpool Stanley Hospital.—H.P., Two H.S.'s, and Gynæcological H.S. Each at rate of £100.
Macclesfield General Hospital.—Second H.S. At rate of £150.
Maidstone, Kent County Ophthalmic and Aural Hospital.—H.S. to Ear, Nose and Throat Dept. At rate of £200.
Manchester and Salford Hospital for Skin Diseases.—H.S. £100.
Manchester City.—M.O. for Maternity and Child Welfare. £600.
National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. At rate of £150.
Northern Rhodesia, Roan Antelope Copper Mines, Ltd.—Jun. M.O. £900–£1000.
Oswestry, Shropshire Orthopædic Hospital and Agnes Hunt Hospital.—H.S. At rate of £200.
Plymouth City Mental Hospital, Blackadon, Ivybridge.—Med. Supt. £750.
Plymouth Royal Eye Infirmary.—Hon. Surg.
Portsmouth, St. Mary's Hospital, Institution and Children's Home.—Third Asst. Res. M.O. £250.
Preston and County of Lancaster Royal Infirmary.—H.S. £150.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Asst. Res. M.O., Res. Anæsthetist. Also Dist. Res. M.O. At rate of £80.
Richmond, Surrey, Royal Hospital.—Jun. H.S. At rate of £100.
Royal National Orthopædic Hospital, Great Portland-street, W.—H.S. At rate of £150.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.P. At rate of £100.
St. John's Hospital, St. John's Hill, Wandsworth, S.W.—Second Asst. Res. M.O. £400.
St. John's Hospital for Diseases of the Skin, 49, Leicester-square, W.C.—Sen. and Jun. Hon. Med. Registrars.
St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, W.C.—H.S. At rate of £75.
Salford Royal Hospital.—H.S. to Orthopædic Dept. At rate of £125.
Sheffield, Jessop Hospital for Women.—Asst. H.S. At rate of £100.
Sheffield Royal Infirmary.—Asst. Cas. O. At rate of £80.
Stafford, Staffordshire General Infirmary.—H.S. and H.P. At rate of £200 and £150 respectively.
Taunton and Somerset Hospital.—Jun. House M.O. At rate of £100.
Tiverton Hospital, Devon.—H.S. At rate of £100.
Truro, Royal Cornwall Infirmary.—H.S. £170.
West Bromwich and District General Hospital.—H.S., H.P., and Cas. H.S. Each at rate of £200.
West London Hospital, Hammersmith-road, W.—H.P., Two H.S.'s and Res. Anæsthetist. Each at rate of £100.
West Middlesex Hospital, Isleworth.—Asst. M.O. At rate of £250.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Four Chief Clin. Assts. Each 1 gn. per session.
Willesden U.D.C.—Asst. M.O. £600.
York City Hospitals, Maternity Hospital and Sanatorium.—Res M.O. £350.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Bodmin (Cornwall), and Ross (Hereford).

The Home Secretary gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act for the Districts of the Kingsbridge, Plymouth, and Totnes County Courts. Applications for the post should reach the Private Secretary, Home Office, Whitehall, S.W., not later than March 8th.

The Home Secretary invites applications for the post of Medical Referee under the Workmen's Compensation Act, to deal with cases arising in the districts of the Chard, Langport, Taunton, Wellington, and Williton County Courts (Circuit No. 57). Applications should reach the Private Secretary, Home Office, Whitehall, London, not later than March 1st.

The Home Secretary also gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act, for Midlothian County (Sheriffdom of the Lothians and Peebles. Applications should reach the Private Secretary, Scottish Office, Whitehall, London, not later than March 3rd.

Births, Marriages, and Deaths.

BIRTHS.

Aymer.—On Feb. 8th, at Oakwood-court, Kensington, the wife of Dr. Aymer, of Holmwood, St. John's-road, Boscombe, Hants, of a daughter.

DEATHS.

Apperly.—On Feb. 7th, at The Dower House, Gerrards Cross, Bucks, Ebenezer Apperly, L.D.S. R.C.S. (Eng.), in his 86th year.

Green.—On Feb. 5th, at Queen Alexandra's Military Hospital, Millbank, S.W., Major-General Sebert Francis St. Davids Green, C.B., C.B.E., M.D. (late R.A.M.C.), aged 62.

Hempson.—On Feb. 6th, at Tunbridge Wells, William Ernest Hempson, aged 71.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET,"

VOL. II., 1929.

The Index and Title-page to Vol. II., 1929, which was completed with the issue of Dec. 28th, is now ready. A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of The Lancet, 7, Adam-street, Adelphi, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Notes, Comments, and Abstracts.

ALEXANDRA DAY.

Alexandra Rose Day this year is to be June 24th for London and any place within 50 miles. Other places can choose for the celebration any day they wish after arrangement with the Rose Day authorities. It is a curious fact that this charitable institution is not even more widely supported than it is, for it is one of the best and most economically managed of all similar efforts. The organisation takes 5 per cent. of what is collected, the rest going to the charities. These are not necessarily hospitals, but any charity for aiding the sick, the allocation being in the hands of the local organisers. The roses are all made by crippled children, and are, of course, supplied by the Rose Day Organisation, as is all necessary information and propaganda. These can be obtained from the Organiser, Miss Mary Beeman, 33, The Boltons, London, S.W.10.

Many hospitals in the provinces do not avail themselves of the Rose Day opportunities, and this seems a pity, both from their own point of view and from that of the Rose Day organisation; for the latter, successful though it already is, is still anxious to extend the field which it has covered during the last 19 years. At first it was purely a London affair, but now it embraces the provinces as well as places abroad, and it has since its inception distributed more than one and a quarter million pounds in aid of hospitals and institutions which care for the sick. We believe that those bodies which are not yet affiliated to the Alexandra Rose Day Fund, and which are eligible so to be, would find that any trouble involved in taking part in the Rose Day collection would repay them handsomely.

HEALTH WORK OF THE LEAGUE OF NATIONS

A SURVEY OF TEN YEARS.

THE last chapter of Mr. John Eppstein's attractive History of the Origins of the League and of its Development from A.D. 1919 to 1929 (London: Mayfair Press, 7s. 6d.) contains an account of the social services of the League which, as Mr. Bernard Shaw has said, would justify its existence ten times over. Mr. Eppstein tells us how the call came to the League from Eastern Europe before any permanent health section had been established at Geneva. The danger was so urgent along a line from the Baltic to the Black Sea that only the combined Governments of Europe could possibly provide assistance on the needful scale. It was to face this threatening crisis that the League Covenant authorised the appointment of a health organisation under which Dr. Norman White set up a chain of hospitals and quarantine stations which saved the rest of Europe from pestilence. The situation was reviewed by the Warsaw Health Conference in 1922, shortly after which the movement of Greek refugees gave rise again to the fear of a spread of cholera, small-pox, typhoid, typhus, and dysentery throughout Western Europe. Moved by these events, the Third Assembly of the League in 1923 gave a definite constitution to the Health Organisation with a standing committee of 16 members, and Dr. Rajchmann the first director. Two years later the Epidemiological Bureau was established at Singapore to which all outbreaks of fever in the Far East were to be reported, something like 150 ports being brought into constant touch with the central station. What has followed since is common knowledge, but it may be noted with interest that Bolivia, as her first act on returning to the League after a long absence from Geneva, requested the assistance of the League in reorganising her public health service.

PUBLIC HEALTH IN IRAQ.

THE latest report on the administration of Iraq, issued by the Colonial Office, shows that 24 hospitals and 78 dispensaries are maintained. The total number of beds in the hospitals is 1205, but it is stated that while the accommodation is generally adequate for the immediate requirements of most provinces, that in Baghdad and Mosul remains unsatisfactory. Serious cases are turned away daily in both places, particularly in Baghdad, where the average duration of stay of patients in hospital is still not more than 11 days. The Government, however, has under consideration a scheme for increasing the beds for free patients at the Royal Hospital, Baghdad, from 250 to 500, and for rebuilding the specialist institutions situated in that hospital. As regards Mosul, a new hospital of 220 beds has been included in the building programme of the Government for 1929. The new Maude Memorial Out-patient Department at the Royal Hospital, Baghdad, new hospital buildings at Diwaniya and Amara, the Royal Iraq College of Medicine, and a new mortuary and operating theatre at the Royal Hospital were all nearing completion at the end of the year. The total number of in-patients and of out-patients treated in health service institutions showed the increase over those treated in 1927 and even over those treated in 1926, which was an epidemic year for malaria in Iraq. There were no epidemics of general ailments such as malaria or influenza during 1928, and the statistics may therefore be taken as showing a very definite increase in the normal work of the Health Service. The work of charitable institutions is a very small factor in the problem of the medical treatment of the population. Of the 1035 cases treated during the year in such institutions, 1011 were admissions to the Meer Elias Hospital, which is a Jewish infirmary, and to the Rima Khedoury Eye Hospital, another Jewish institution, both in Baghdad. Iraq is unfortunate, in comparison with most other countries, in having so little assistance from voluntary sources in the field of medical work. The Anglo-Persian Oil Company at Khanaqin and the Turkish Petroleum Company in the Kirkup province maintain their own doctors and hospitals for the treatment of their employees. Their dispensaries also freely treat the country people near the oilfields.

There is still difficulty in finding Iraqi doctors to fill posts in out-stations, and this will continue for a few years, but the establishment of the medical school has removed anxiety for the future. There is also a shortage of other trained medical personnel, such as pharmacists, dressers, and nurses, which causes great difficulty in the establishment of new dispensaries and in the development of existing health institutions. This results from the strict economy enforced upon the Health Service, which has made it impossible to entertain in its large institutions surplus personnel under training for future requirements.

The number of births registered in Baghdad (with a probable population of 250,000) in 1928 was 5167; in Basra (80,000) 980; and in Mosul (80,000), 2763. The deaths registered in the same period were in Baghdad 6396, in Basra 1670, and in Mosul 2686. In the absence, however, of reliable census figures it is impossible to calculate birth- and death-rates with any statistical value for these towns. The percentage of deaths under one year was in Baghdad 30·7, in Basra 26·3, and in Mosul 39·9. Maternity and child welfare work is being gradually developed in the large towns.

SUPPLY OF OFFICERS FOR THE R.A.M.C.

A CORRESPONDENT writes: On looking through some old files of *Punch*, I came across the enclosed, which may interest you. Apparently the Army had some difficulty in obtaining medical officers at that period, 54 years ago.

Dearth of Army Doctors.—The papers report a grievous lack of candidates for the Commission of Medical Officers in the Army. Private practice is lucrative to few but the most eminent Physicians and Surgeons. Anything like adequate pay and position on a firm footing with Combatant Officers surely might be expected to attract at least a sufficiency of Army Surgeons. These attractions have yet to be tried. (Feb. 19th, 1876.)

UTOPIAS.

THOSE who like guessing about the future of a world in which man is the only live thing whose existence is recognised may find some interest in two small books[1]; but they are mostly idle and narrow speculation. Mr. Bernal imagines that a human of the nature of a robot really will make himself a happy home beyond the bright blue skies (spherical in shape) where he will subdue his passions and stupidities. Mr. Hatfield proposes a mechanised state in which no one need think; he seems to say little more than that the process whereby the hard lessons of experience have become instinctive reactions will continue in the future as it has in the past. Neither of their visions bears the stamp of authentic prophecy.

EHRLICH'S ALDEHYDE REACTION.

THE reagent used in this test for urobilin and urobilinogen is a 3 per cent. solution of paradimethylaminobenzaldehyde in 50 per cent. hydrochloric acid. Our attention has been called to an erroneous extra syllable "azo" which has inadvertently slipped into the name of the reagent as given on p. 10 of THE LANCET Extra Number No. 1 on Modern Methods in Abnormal and Difficult Labour. The writer was there following a similar slip in an earlier edition of Beaumont and Dodds's "Recent Advances in Medicine."

A BLOOD-SUGAR CHART.

Messrs. H. K. Lewis and Co. have sent us a specimen of a blood-sugar chart for recording sugar tolerance. The average normal percentages after ingestion of 50 g. of glucose are set out in red at intervals of 30 minutes, on which the clinician superposes in black the values which he obtains in a particular case. The charts are priced at 6s. per 100 or 50s. a thousand.

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[1] The World, the Flesh, and the Devil. By J. D. Bernal. Pp. 96. The Conquest of Thought by Invention. By H. S. Hatfield. Pp. 117. London: Kegan Paul, Trench, Trübner and Co. 1929. 2s. 6d. each.

Hunterian Oration

ON

HERO WORSHIP IN SURGERY.

Delivered in the Royal College of Surgeons on Feb. 14th, 1930,

BY ERNEST W. HEY GROVES, F.R.C.S.,

PROFESSOR OF SURGERY IN THE UNIVERSITY OF BRISTOL.

"One comfort is, that Great Men, taken up in any way, are profitable company. We cannot look, however imperfectly, upon a great man, without gaining something by him"—*Carlyle, "Hero Worship."*

MY LORD, LADIES AND GENTLEMEN,—We have met to-day on the birthday festival of John Hunter, one of the greatest heroes of English surgery.

Considerably more than a century has elapsed since in 1814 this Oration was founded by Hunter's executors, Dr. Matthew Baillie and Sir Everard Home, "in honour of surgery and in memory of men by whose labours it has been advanced."

In pursuance of this bequest the Oration has now been delivered 75 times, 38 of which have been in the present theatre. Of these, 68 have been published and are now in our library. It would be presumptuous on the part of the present speaker to utter one word without having first read all these published orations. They now cover a sufficient period of time (1814 to 1928), and that a period of the greatest growth and activity in surgery, to make their perusal one of great interest and instruction, especially in marking notable landmarks in the history of surgery and this College.

NOTES OF THE PREVIOUS ORATIONS.

EVERARD HOME, *1814*.—Wiseman as founder of surgery in 1600. Emancipation of surgery from medicine. Knowledge of anatomy chief advance in surgery. Cheseldon: anatomy, lithotomy. Pott, Hunter: anatomy. General principles of animal life. The importance of experiment.

SIR WILLIAM BLIZZARD, F.R.S., *1815*, Surgeon to the London Hospital.—General reflections on surgery and its relation to anatomy. Harrison: first surgeon and founder of London Hospital. Belchier, Sharpe, Hawkins, Cheseldon, Pott, Bromfield, Warner, Thomson. Compare Newton with Hunter. Relation of life to matter.

HENRY CLINE, *1816*.—Not published.

WILLIAM NORRIS, *1817*, Master of the College, Surgeon to Charterhouse and Magdalen Hospital.—Early teachers: Hippocrates, Celsus. John Arden, Leader of surgery during the Renaissance. Traces beginning of improvement in modern surgery to the regular teaching of anatomy. William Hunter, Percival Pott: "In London there are seven large Hospitals." Life work of John Hunter. His Museum.

SIR DAVID DUNDAS, Bt., *1818*, Sjt. Surgeon to H.M. King George III.—Ancient teachers. First effect of firearms. Appearance of venereal disease. Paré: use of ligatures instead of caustics or cautery. Wiseman, Cheseldon, Pott. Hunter on gunshot wounds—not necessary to enlarge such wounds without special reason. Work about popliteal aneurism. Hunter's doctrines of the nature of life. Eulogy on George the Third in relation to encouragement to science and surgery. Obituary notice of Sir James Earle. Improvements in extracting cataract and in treating hydrocele. "If at any former time surgeons . . . allowed themselves to be under the control of physicians that is not likely to happen again."

JOHN ABERNETHY, F.R.S., *1819*, Surgeon to St. Bartholomew's Hospital.—The nature of surgery. Early history of surgery. Rise of the Barber surgeons. Haller's work as a physiologist. Plea for greater facilities for getting bodies for dissection; also for post-mortem examinations. "Those who far precede others must necessarily remain alone." "His disposition to distrust opinions and to examine every subject for himself." Eulogy of Hunter's character and benevolence.

ANTHONY CARLISLE, F.R.S., *1820*, Surgeon to Westminster Hospital, Surgeon Extraordinary to H.M. George IV.—Obituary notice of Will Hey. A very eloquent—rather pompous—eulogy of Hunter, but going out of the way to point out his lack of learning, of languages and science.

THOMAS CHEVALIER, F.R.S., *1821*, Surgeon Extraordinary to King George IV., Professor of Surgery and Anatomy to the College.—History of Surgery, life and work of Hunter. Refers to treatment of chronic ulcer of the leg, and to Underwood, Bayntum, Sir Joseph Banks, Cuvier.

SIR EVERARD HOME, Bt., P.R.C.S., *1822*, Senior Surgeon to St. George's Hospital.—Refers to granting by George the Fourth of new Charter and the raising of the College to the status of a Royal College. Account of life and works of Sir Joseph Banks, who accompanied Captain Cook round the world (Vice-President of Royal Society).

SIR WM. BLIZZARD, P.R.C.S., *1823*, Surgeon to the London Hospital.—Preface repudiates fear that the subjects for Hunter's Oration would soon be exhausted! Deplores the prevalence of practice by unqualified surgeons. Sir Joseph Banks, Sir Charles Blicke, Sir James Earle, Mr. Long, Mr. Keate, Mr. James Wilson, Mr. Chandler, Mr. Hey, Dr. Jenner. "The Council of this College are unshaken in their confidence in the efficacy of vaccination."

HENRY CLINE, *1824*.—Not published.

WILLIAM NORRIS, P.R.C.S., *1825*, Surgeon to Charterhouse and Magdalen Hospitals.—On medical education. The Hunterian Collection.

SIR ANTHONY CARLISLE, F.R.S., *1826*, Surgeon to H.M. King George IV. and to Westminster Hospital.—Arguments in favour of study of zootomy and animal anatomy. Description of the oyster and discussion on the formation of shell, teeth, and bones.

H. LEIGH THOMAS, F.R.S., *1827*.—Life and work of Cruikshank, his anatomical researches. Of Hunter he says: "The calibre of whose capacious mind, not being circumscribed by devotion to received opinions, studied solely the book of Nature."

SIR WM. BLIZZARD, *1828*, Senior Surgeon to the London Hospital.—Again deplores the practice of unqualified surgery. He argues against the establishment of special military and also of ophthalmic hospitals. Obituary of Shaw, Harkness, Wm. Norris.

JOHN VINCENT, *1829*, Surgeon to St. Bartholomew's Hospital.—"The measure of excellence in man is discovered in his aptitude to be governed by the power of truth." "One of the most powerful influences that retard the advancement of science is opinion. Opinion is the admission of a proposition without proof." Obituary notices of Heaviside, Macgregor, and Long.

GEORGE JAMES GUTHRIE, *1830*.—Not published.

ANTHONY WHITE, *1831*.—Not published.

SAMUEL COOPER, *1832*, Professor of Surgery to the University of London, Surgeon to the Bloomsbury Dispensary.—"The noble and opulent—as the patrons and dupes of murderous quackery." Appreciation of Hunter. Historical retrospect. Obituary of John Abernethy and Headington.

JOHN HOWSHIP, *1833*, Surgeon to St. George's Infirmary.—Historical retrospect. Comments on Hunter's Museum. Obituary notices of Abernethy, Sir Everard Home, and Baron Cuvier.

SIR WILLIAM LAWRENCE, F.R.S., *1834*, Surgeon to St. Bartholomew's Hospital.—History of Hunter. Adverse criticism of his work on venereal disease. Refers to Museum, Hunter's specimens 7833.* Additions 3951. Refers to the distribution of his MSS. and to Abernethy and Cuvier.

1835 and *1836*.—No Orations.

SIR BENJAMIN BRODIE, Bt., F.R.S., *1837*, Sjt. Surgeon to the King, Surgeon to St. George's Hospital.—Regards treatise on blood and inflammation as Hunter's most important work. First instance of inductive method of philosophy applied to pathological science. "He loved knowledge for its own sake." Obituary notices of Sir Everard Home, Sir W. Blizzard. Refers to the completion of the new building.

BENJAMIN TRAVERS, F.R.S., *1838*, Surgeon Extraordinary to H.M. the Queen, Surgeon to St. Thomas's Hospital.—Hunterian eulogy. Obituary of Henry Earle. "If to have lived in advance of the time be, as has been said, the truest test of genius, let Hunter be tried by this standard."

EDWARD STANLEY, F.R.S., *1839*, St. Bartholomew's Hospital.—"The successful treatment of aneurism, to be reckoned the fairest of the fruits of Hunter's genius." Refers to Hunter's first and third cases who lived 40 years after the operation. Later surgical advances. Lithotrity, tenotomy for congenital deformities. Treatment of fractures by apparatus, which fixed the fracture but allowed movement of the limb. Thomas Blizzard and Swan.

JOSEPH HENRY GREEN, F.R.S., *1840*, Surgeon to St. Thomas's Hospital.—Obituary notice of Henry Coleman. Discourse on medical philosophy. Bacon's deductive logic. Hunter's vital dynamics. "He brought the whole art of healing into immediate connexion with the speculative sciences of Nature." Evolution of the idea of power. Transcendental anatomy. Gradation of animal life. Characteristics of man's bodily frame. Hunter's pathology. Ideas of instinct.

Thomas Callaway, *1841*.—Not published.

G. C. Babington, *1842*, Surgeon to St. George's Hospital.—Obituary of Sir Astley Cooper. "John Hunter's discoveries are great in themselves; but their true value is to be found in the number of other discoveries to which they have given birth." Hunter as an exponent of the Baconian philosophy.

James Arnott, *1843*, Surgeon to the Middlesex Hospital.—Obituary notice of Sir Charles Bell, his work on the nervous system. Lairey who instituted mobile ambulances and rose with the rise of Napoleon. Hunter's Museum. Work on Aneurism, refers to 389 cases with 277 successes.

John F. South, *1844*.—Not published.

1845.—No Oration.

Sir William Lawrence, F.R.S., *1846*, Surgeon Extraordinary to the Queen, Surgeon to St. Bartholomew's Hospital.—Refers to Jenner's discovery as arising out of his education by Hunter. Hunter's specimens numbered 10,563,* and to these had been added 12,347. Refers to Mr. Paget being appointed to write the catalogue of the pathological specimens. Foundation and origin of the Royal College of Surgeons; the Museum and Library. Heated defence of the policy of the R.C. of Surgeons and criticism of the suggested "Royal College of General Practitioners."

Joseph Henry Green, *1847*, Surgeon to St. Thomas's Hospital.—Refers to the recent institution of the Fellowship. The foundation of a liberal education. Language, literature, mathematics, natural history. The cultivation of scientific insight. Value of a University education.

Richard Grainger, F.R.S., *1848*, Surgeon to St. Thomas's Hospital.—The recent scientific advance of anatomy and physiology. Embryology: development of the mammalian ovum. The dependence of function on structure. Microscopical anatomy. The nature of secretion. Physiology based on physics and chemistry. Obituary notices of Liston and Morgan.

Cæsar H. Hawkins, *1849*, Surgeon to St. George's Hospital (Prince Albert present).—States that the pathological specimens in the Museum had doubled in number. Library contained 23,000 volumes. Obituary notices of Briggs, Callaway, Samuel Cooper. Progress in physiology—excretion and secretion. Humoral pathology. Discovery of anæsthesia. Notes increasing international coöperation in science, but suggests that there is urgent need for similar coöperation in regard to experience and statistics among hospitals.

Frederick C. Skey, F.R.S., *1850*, St. Bartholomew's Hospital.—Obituary of Clift who had preserved the Hunterian Collection until it was taken over by the R.C. of Surgeons. Also of Key, Andrews, Morton (Newcastle), Pennington. "The profession of medicine is at the present day a degenerate pursuit." Want of education, ignorance of classics and of science. Urges the need of preliminary education. Deplores the system of apprenticeship. "The degenerate standard of medical ethics." "The law only allows the doctor to be remunerated for selling physic."

R. A. Stafford, *1851*.—Printed but not delivered. Jenner, Dr. Baillie, Abernethy, Astley Cooper, Clift, Samuel Cooper, Charles Bell, Earle.

James Luke, *1852*, Senior Surgeon to the London Hospital.—Obituary of Vincent. Importance of education. Hunter's philosophy and his Museum.

Bransby Cooper, F.R.S., *1853*, Surgeon to Guy's Hospital.—Describes Hunter's work, illustrated by specimens from the Museum. Obituary notices of Vincent, Dalrymple, Pereira, Sir Charles Forbes, Sir John Webb, Lawrence, and Dr. Mantell. The first occasion when the Oration was given in the present theatre.

1854.—No Oration.

Joseph Hodgson, F.R.S., *1855*.—Examination of Hunter's teaching. "The founder of scientific physiology." An appreciation of Jenner who saved 80,000 lives each year.

Thomas Wormald, *1858*.—Hunter's work on inflammation of veins and in curing aneurism. Mentions that Prof. Owen had left the R.C. and S. for the British Museum.

John Bishop, *1859*, Surgeon to the Northern Dispensary.—Museum contained 45,000 preparations, of which 14,000 were microscopic. Obituary notices of Keate, Travers. Improvements in microscope. Pathology of inflammation. Work of Virchow and Lister. Ollier's work on the periosteum. New Medical Act. Advances in physiology, chiefly in relation to the nervous system.

William Coulson, *1861*.—Refers to the fact that Hunter's remains had been transferred to Westminster Abbey. "As he had laid the foundation of scientific surgery so did he found what I venture to term physiological pathology."

George Gulliver, F.R.S., *1863*.—Hunter's ideas of the blood. Doctrine of fibrin and its nature. Obituary notices of Quekett, Norman, Stanley, Brodie, Hewson.

1865.—Not published.

John Hilton, F.R.S., *1867*, Surgeon to Guy's Hospital.—Chiefly a discussion of Hunter's doctrines of sympathy (one diagram from Hunter).

Richard Quain, F.R.S. and P.R.C.S., *1869*.—Hunter and his Museum. *Arrest of medical progress in dark ages* ascribed to the abuse of authority in education. Criticism of English school and University education. Folly of *spending most time on dead languages*. Plea for good teaching of English language and of natural science.

Sir Wm. Fergusson, P.R.C.S., F.R.S., *1871*, Surgeon to the Queen.—Hunter's life and Museum. Four illustrations of grafting. Hunter's experiments on spurs and teeth grafted on cock's comb. Obituary notices of Wardrop, Sir W. Lawrence, Hodgson, Sir James Simpson, James Syme.

Henry Hancock, *1873*, Surgeon to Charing Cross Hospital.—Obituary notice of Skey, Sir James Palmer, Sir John Fife, Solly, Parker, Kempe, Delagrade, Carden, Poland, Coote. Considers that the lack of education was no bar to Hunter's progress. Recites the many men of genius who have been in like circumstances. Criticises the examination system. Thinks it would have kept Hunter out.

Le Gros Clark, F.R.S., *1875*, Surgeon to St. Thomas's Hospital.—Obituary notices of Partridge, Jordan, Bishop, Cutcliffe, Turner, Wormald, Wyatt, Cutler, Swan, Martin, Kiernan. Refers to proposed coöperation with Royal College of Physicians for Conjoint examination. Conservative tendency of surgery. Importance of rest. Water more useful than drugs. Excision of joints. Excision of cancer. "I feel persuaded that the antidote to this malignant disease must be sought in therapeutics and hygienic measures." Deplores that the printing and illustrating of books substitutes reading for dissection and clinical observation. "A love of truth was the mystic altar before which he ever knelt, the energising impulse which determined and regulated his every aim and purpose, the guiding star of his existence."

Sir James Paget, *1877*, Surgeon to St. Bartholomew's Hospital (before the Prince of Wales).—"The happiness of intellect is in its work." "The desire for knowledge, both for its own sake and for the happiness of gaining it and using it became like an insatiable passion." "For Hunter's true thoughts still live in us and they will live after us and never cease to help and urge men onward in the pursuit of truth." "In the world of mind he that is mortal may produce that which is immortal." Obituary notice of Sir Wm. Fergusson.

George Murray Humphry, *1879* (Cambridge).—Two salient, all-pervading features, which may be expressed by the words "work" and "thought," or "observation" and "reflection." First mention of antiseptic treatment of wounds. Spencer Wells and Keith's establishment of ovariotomy. The urgent need of experimental research. The difficulties raised by opponents of experiment. True principles of teaching should be to give facts which lead to and establish principles. Growth of knowledge—danger of cramming. Danger of examinations. Obituary notice of John Hilton, George Firth.

Luther Holden, *1881*, Surgeon to St. Bartholomew's Hospital.—Throws doubt on the alleged lack of education. Thinks Hunter was at school and then at Glasgow University, and studying with Cullen before he went to London. Tribute to Hunter as an anatomist, comparative anatomist, physiologist, and pathologist. Plea for classic education. Obituary notice of Henry Hancock, Callender.

Spencer Wells, P.R.C.S., *1883*.—Obituary notices of Luke, South, Gulliver, George Crichett (progress in ophthalmology). Joseph Clover (anæsthesia), and many others less known. Progress in military and naval surgery. Transport of wounded. Advantages of anæsthetics and antiseptics. Progress of abdominal surgery. Deplores the difficulties and restrictions placed in the way of experiments. First reference to bacteria. Cheyne visiting Koch and working on tubercle. Work of Pasteur and Devine on microbes. "We support the law which protects the many from the danger to which a few ignorant opponents of compulsory vaccination would expose the whole population." Thirty diseases in man and animals proved to depend upon specific microbes.

JOHN MARSHALL, F.R.S., *1885*, Surgeon to University Hospital.—Obituary notices of Allen Thomson, Cæsar Hawkins, Erasmus Wilson. After a sketch of John Hunter's life he attempts to estimate his opinion in regard to modern developments. Would resent restrictions on experiment. Was on the same idea as Darwin. Variation in species and stages of embryo showing same changes as in race. Anæsthetics and antiseptics.

WILLIAM S. SAVORY, F.R.S., *1887*, Surgeon to St. Bartholomew's Hospital.—The philosopher of surgery. The idea of the unity of design. "He effected more by the nature of the questions which he set than by the answers which he worked out." "Is not surgery itself then as a science in danger from the extension of surgery as an art?"

HENRY POWER, *1889*, Surgeon to St. Bartholomew's Hospital.—Hunter as a physiologist and experimenter. The value and results of recent physiological experiments. "The experiment and researches of Sir J. Lister." The new rooms devoted to research.

JONATHAN HUTCHINSON, F.R.S., *1891*, Surgeon to the London Hospital.—Obituary notices of Matthews Duncan, John Marshall. Claim for reference to mother in tracing character. Great estimate as a naturalist and philosopher. Poor opinion of his writings on venereal disease. Considers that knowledge of geology shown in his catalogue of fossils as very remarkable as being before his time.

THOMAS BRYANT, *1893*, Surgeon to Guy's Hospital (given before H.R.H. the Prince of Wales and H.R.H. the Duke of York).—Obituary notices of Prescott Hewitt, John Wood, Berkely Hill, Sir Wm. Bowman, Charles Hawkins, Le Gros Clark, Edward Cock, Samuel Lane, Alfred Baker, Sir Richard Owen, aged 87.

J. W. HULKE, *1895* (died on Feb. 19th; the Oration read by Thomas Bryant).—Hunter as a biologist. Movement of sensitive plants. Classification of animals.

CHRISTOPHER HEATH, *1897*, Surgeon to the University College Hospital.—Hunter's greatness as a surgeon. Reply to Jesse Foot. Work on aneurism and on venereal disease. Obituary notices of Hulke, Savory (refers to the early days of member's agitation for share in the government of the College). Durham, Erichsen, Humphrey, Spencer Wells.

SIR WM. MACCORMAC, *1899*, Surgeon to St. Thomas's Hospital (before the Prince of Wales).—General account of John Hunter. "The surgery of the Middle Ages was a trade. Ambroise Paré and Jean Louis Petit converted it into an art; John Hunter elevated it to the rank of a science." Animal heat; cranial surgery; aneurism. Venereal disease. Inflammation. Gunshot wounds. The Museum. Anæsthetics. Antiseptics. "Lister has finally crowned the edifice whose cornerstone John Hunter laid." Obituary notices: Oliver Pemberton, Bailey (Librarian), Rivington, Lund (Manchester), Lee.

N. C. MACNAMARA, *1901*.—Refers to the death of Queen Victoria. Obituary notice: *Sir James Paget*. Craniology. Refers to Sir Wm. Lawrence's lectures as being the first reference to the idea of the common origin of man and ape. Description of typical skulls.

H. G. HOWSE, *1903*, Surgeon to Guy's Hospital (MSS. only). Life and work of John Hunter. The greatness of his work in associating structure with function. Recent specimens. Hairy rhinoceros from Siberia. Casts and specimens showing evolution of horse. Obituary notices of Spencer Smith, Sir Wm. MacCormac.

JOHN TWEEDY, P.R.C.S., *1905*.—Obituary notices of Luther Holden, John Birkett, John Simon. "The greatest men are estimated by the influence they exert upon the thoughts and activities of those who follow them." Defence of animal experiments.

HENRY T. BUTLIN, *1907*, Surgeon to St. Bartholomew's Hospital.—Obituary notice of Christopher Heath. Description of Hunter's life and work. "(The great man) should see clearly truths which are still hidden to ordinary mortals."

HENRY MORRIS, *1909*, Surgeon to Middlesex Hospital (before T.R.H. the Prince and Princess of Wales, also Lord Rosebery and nine ladies and gentlemen of the Court).—Obituary notices of Sir Jos. Fayrer, Timothy Holmes, Wm. Allingham, Reginald Harrison, Sir Alfred Cooper, Prof. Charles Stewart (Curator). Hunter as a philosopher. The inductive method. A history of the intellectual movements in England, Scotland, and France. The conflict of the deductive and the inductive philosophies in Hunter's work.

EDMUND OWEN, *1911*, Surgeon to St. Mary's Hospital.—John Hunter and his Museum. Early life of Hunter. In July, 1768, at a Court of Examiners, John Hunter was examined and received his diploma (aged 40). Elected as a member of the Court of Assistants (Council) in 1789. He attended 14 meetings out of 26. Description of Hunter's inoculation with venereal disease and its effect on his arteries and death. Appreciation of Hunter, Pasteur, Lister.

SIR RICKMAN GODLEE, *1913*, Surgeon to University College Hospital.—Attributes to him the thought "What is life?" in the portrait. Mentions that Clift only received seven shillings a week for seven years. Reproductions of famous pictures: Hunter, Clift, Owen, Quekett, Flower, Stewart, and also of several of Hunter's house, museum, &c. Original 13,600* of Hunter's specimens increased to 64,766. Description of Museum. Imagining Hunter's return. Plea for a modern "institute of anatomy and pathology." Obituary notices of Dent, Butlin, Lister. Compares Hunter and Lister, taking nothing for granted, always experimenting, "body, blood, and motion."

SIR WM. WATSON-CHEYNE, P.R.C.S., *1915*, Surgeon to King's College Hospital.—Treatment of gunshot wounds. The problem of antiseptics.

SIR GEORGE MAKINS, *1917*, Surgeon to St. Thomas's Hospital.—Hunter as a military surgeon. Treatment of gunshot wounds. Limitation of antiseptics. Aneurism. Simultaneous ligature of artery and vein.

SIR ANTHONY BOWLBY, P.R.C.S., *1919*, Surgeon to St. Bartholomew's Hospital.—British military surgery in the time of Hunter and in the Great War. Conditions of military surgery in days of Hunter compared with those during the Great War.

SIR CHARTERS SYMONDS, *1921*, Surgeon to Guy's Hospital.—Life and work of Sir Astley Cooper. Remarks on medical education. Plea for more clinical and less preliminary work.

SIR JOHN BLAND-SUTTON, *1923*, Surgeon to the Middlesex Hospital.—*John Hunter—his affairs, habits, and opinions*. A description of Hunter's work, chiefly as a biologist, with many interesting references to recent discoveries—*e.g.*, the breeding of eels, the hearing of whales, and the early life of the kangaroo.

SIR D'ARCY POWER, *1925*.—Critical review of Hunter's illness with evidence of cerebral syphilis. Illustrations from Jesse Foot's life.

SIR BERKELEY MOYNIHAN, P.R.C.S., *1927*, Leeds (before H.R.H. Princess Mary).—Hunter's ideals and Lister's practice. The methods of the two great men and their results.

SIR HOLBURT WARING, *1928, Senior Surgeon to St. Bartholomew's* Hospital.—The progress of surgery from Hunter's day to ours.

Note.—The references to the Orations since 1913 are very brief, as these have been so recently published.

* The discrepancy between the figures given in 1834, 1846, and 1913, relating to the number of Hunter's specimens, is due to the fact that for years after Hunter's death further of his specimens came to light. Of these the largest group were the fossils, numbering 3709, found and described by Owen.

The controversial subjects referred to have been: the teaching of anatomy as the foundation of sound surgery; the emancipation of surgery from medicine; the problem of procuring bodies for dissection; the menace of quackery; and the agitation by Members of the College for a share in its government.

The chief matters of surgical advance have included: vaccination; scientific physiology and embryology; anæsthesia; bacteria and antiseptics; abdominal surgery and ovariotomy.

Notable stages in the advance of the College referred to have been: the granting of the Charter by George the Fourth; completion of the present building; foundation of the Fellowship; formation of the Conjoint Board; moving of John Hunter's remains to Westminster Abbey; and growth of the Museum from 13,600 specimens, bequeathed by Hunter to 64,766.

Six times the Oration has been delivered before members of the Royal Family, the first time by Cæsar Hawkins, before the Prince Consort in 1849, and the *last* by Sir Berkeley Moynihan in 1927, before the Princess Mary.

RECENT LOSSES.

When I undertook to deliver this Oration I had hoped to say that subsequent to 1913, its first centenary, all the orators were still with us, but now we have to deplore the death of Sir Anthony Bowlby, K.C.B., K.C.M.G., K.C.V.O., who gave the Oration in 1919 and was our President from 1920 to 1922. Intimately known and dearly loved by all the Bart.'s students who came under his kindly supervision, a sound surgeon and a wise teacher, Bowlby during the time of the Great War reached the zenith of his fame and influence. He served at the Front in France, during the entire conflict, and he was largely responsible for the organisation and equipment of the casualty clearing stations. No one in trouble at home or in the War ever applied to him for help without receiving it in the form of wise counsel and true comradeship.

Three other men notable in this College have also been recently claimed by death.

Thelwell Thomas, of Liverpool, was a Member of the Council from 1921 to 1927. His skill as a surgeon and his kindliness as a friend will always keep him in our memory, but in addition he has bequeathed the generous sum of £5000 to the College which the Council has determined to devote to the benefit of the library.

Thomas Horrocks Openshaw, for many years surgeon to the London Hospital, and chiefly known for his pioneer work in orthopædic surgery, was a member of the Council from 1916 to 1924. He was a safe surgeon and yet always abreast of the times, and his genial personality and splendid fortitude in the tragic death of his brilliant son greatly endeared him to us.

Mr. Victor G. Plarr was the librarian of this College from 1897 to 1929. His quiet and unobtrusive personality made him a stranger to many of our Fellows and Members, but he was always working for the good of the College. That by which he will be best remembered is the work he did in writing lives of the Fellows.

The publication of these lives under the editorship of Sir D'Arcy Power is now being undertaken, the expenses being defrayed by Thelwell Thomas's bequest.

We have also to deplore the loss of the last known descendant of the Hunter family in the person of Miss Helen Hunter Baillie, the great grand niece of John Hunter, who died in February, 1929, at the age of 86. She had been a regular attendant at these orations and had presented a valuable collection of letters and family documents to the library.

RECENT EVENTS.

Having given this brief tribute to the memory of men by whose labours surgery has been advanced, I would follow the example laid down by most of my predecessors in mentioning outstanding events in the history and progress of the College.

The agitation by some of the Members of the College for a direct share in its government, the idea of which was first referred to by Sir William Lawrence in 1846 in his heated denunciation of making the Royal College of Surgeons into a Royal College of General Practitioners and which was first actually mentioned by Christopher Heath in 1897, has continued year by year. It may be said now to have entered upon a new phase, insomuch that the annual meeting at which this topic is discussed, which at one time was the scene of angry strife, is now one of amity and goodwill. This amity has been further increased by Mr. Buxton Brown's generous endowment for the provision of an annual dinner, at which Fellows and Members meet for convivial intercourse.

It is not for me to say if and when the Council of this College will directly represent the 18,000 Members as well as the 2000 Fellows, but I may express a sincere wish that the change, which is in harmony with the modern democratic spirit may take place soon. The chief thing which is needed to bring it about quickly is convincing evidence that the change is desired by the great body of the Members.

The attainment of the Fellowship has been greatly facilitated for those in the overseas dominions by arranging for the primary examination to be held each year abroad. The first examination held last year in Canada was so successful that it will probably be repeated each year and a similar arrangement is now being made for Australia and New Zealand.

Mrs. Macloghlin has left £10,000 and the residue of her estate for the purpose of founding and endowing scholarships for medical students in memory of her husband, the late Mr. Edward Macloghlin, M.R.C.S., formerly in practice in Wigan. A sum of approximately £30,000 has been left by the late Sir George Mackenzie K.C.M.G., C.B., in memory of his friend Sir William Mackinnon, Bt., jointly to the two Colleges for the endowment of medical research.

The Honorary Medal, the award of which was instituted in 1802 for liberal acts or distinguished labours. . . conducive to the improvement of the healing art and which has only 12 times been given, was this year bestowed upon Sir George Makins, G.C.M.G., C.B., LL.D., F.R.C.S., in appreciation of his valuable services to the College, more especially in arranging and describing the series of drawings in the Army Medical War Collection.

Scholarships for research have been founded in this College. Lord Beaverbrook's gift of £1000 was quickly allocated for tissue culture work, and the need for more permanent endowment was evident. The Council has therefore set aside £500 a year for research work, and generous benefactions from Lord Melchett and Sir Louis Baron have placed at our disposal two more similar sums for a like object, so that there will now be expended on vital research a larger sum of money each year than was received by the College as its total income in the days when Hunter received his diploma.

One can hardly question that this movement of greater activity for research would have had Hunter's whole-hearted approval. He spent all his income on his museum and his experiments. The museum was bought by the nation and placed in our trusteeship.

We are proud to think that what originally was a unique collection of 13,000 specimens had increased to over 64,000 when Sir Rickman Godlee delivered his Oration in 1913, and now numbers 72,676, due largely to the addition of the military section acquired during the war, the Onodi and the Strangeways collections, illustrating respectively anatomy of the nose and diseases of the joints.

But Hunter's spirit of never tiring adventure in the search for knowledge, although belauded, has not hitherto been adequately followed.

We are too apt perhaps to be satisfied with what after all is only a collection of dead things and to forget that Hunter's absorbing thought was that of probing the secret and mystery of life. How he would have been thrilled if he could have used a modern microscope and yet more if under that instrument of precision he could have seen the living cells growing and dividing. It is, therefore, a happy thought that among the recent objects of research in this College is that of the culture of living tissues.

One of my predecessors, Sir Rickman Godlee, having spent many hours in the Council room of this College, gazing at the famous portrait of Hunter, became convinced that the look of wrapt attention and reverie on his face was an indication that he was absorbed in the contemplation of this great question "What is life?" The story of the portrait, well known to many here, is nevertheless worth repeating. Hunter had promised to sit for his portrait to Sir Joshua Reynolds, but he proved so restless a sitter that that great painter was in despair of ever getting a soul-revealing picture of Hunter's face. He had made an unsatisfactory beginning as his sitter fidgetted and grumbled, but then owing to some unknown cause, Hunter became absorbed in contemplation as we now see him. The painter without a moment's hesitation turned the canvas round and hastily but faithfully depicted the face at rest, painting it in the space between the legs of the original portrait. I believe that one of the reasons which has led experts to advise against this picture being restored is the fear that restoration might reveal a pair of inverted legs surrounding the leonine face.

We hope that the recent endowment of research and the building of the new laboratories may go a long way towards removing from us the reproach that whilst we have treasured and added to the *things* which Hunter left us we have lost sight of the *ideals* for which he was for ever striving.

Another auspicious event has taken place since the last Oration was given. The President of the Royal College of Surgeons has been elevated to a peerage. Only twice have surgeons been made lords. The first instance was that of Lister, who received his peerage when his days of active surgery were over but when he was the President of the Royal Society. In the second instance we are happy in the knowledge that not only is Lord Moynihan President of this College, but also that he is in the heyday of his surgical virility. Never has his brain been more active, his tongue more eloquent, his hand more firm, or his eye more keen. Because that eye is now upon me, I must desist from any further words of eulogy and I excuse those I have already uttered because it is of this College and the honour which he has brought to it that it is my duty to speak.

In Hunter's day surgery was only just emerging from the lowly position of serfdom to medicine. The very name of barber-surgeons indicated this status, half tradesman and half apothecary, and now two centuries later the Royal College of Surgeons is presided over by a peer.

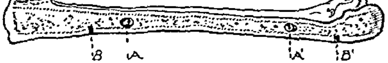
HUNTER'S WORK ON BONES.

Thus far, Sir, my path has lain on conventional lines laid down by my honoured predecessors, and I felt that I could not venture further without seeking for advice and guidance. For these I have sought for inspiration to speak my best about the great Scotsman, John Hunter, from two other Scotsmen, both of whom like Hunter himself have come to this city to enlighten our darkness.

I asked Sir Arthur Keith and his answer was "Bones," and I asked Carlyle and he said "Heroes." In all diffidence, therefore, I will try to follow both their counsels, only asking you to aid my poor words with your imagination in thinking of Keith speaking to you about Bones or of Carlyle thrilling you with his rugged eloquence as he discoursed to you about "The Hero as a Surgeon."

A great part of Hunter's life was spent in handling bones. Anything big and strong and lasting had as much fascination for him as anything that was curious or inexplicable. His greedy longing for the skeleton of the Irish giant, satisfied at last by its nefarious purchase, is the best-known instance of this. Hundreds of skeletons of reptiles, fishes, birds, and mammals were prepared, articulated, and preserved by him and hundreds more were collected as fossils. Indeed, I suppose it would not be far from the truth to say that never before or since has any one man handled so many bones as Hunter.

FIG. 1.

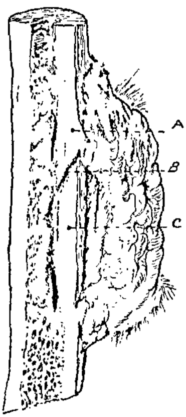


Shot in fowl's tibia. (AA') Shot. (BB') Points marking length of bone when shot were inserted.

But while his hands were busy with the bones his mind was busy with the questions of their formation and their growth. It is with his specimens dealing with these questions that we must occupy ourselves chiefly to-day. They fall into three categories. The first dealing with growth, the second with inflammation, and the third with transplantation.

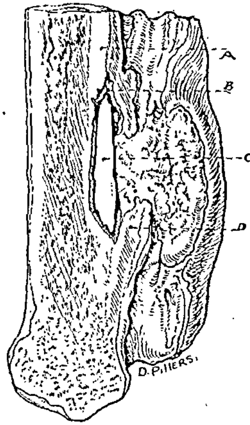
In Hunter's day bone was supposed to grow by a process of interstitial accretion. This was the doctrine of Du Hamel. True to his principle of "Don't think but try" Hunter determined to put this idea of bone-growth to the test. He buried two shot in the tibia of a young animal (both the pig and the fowl were used) two inches apart. (Fig. 1.) After a certain period when the animal had grown considerably it was killed and the shot were found to be the same distance from one another but much further from the two ends of the bone, thus proving that the growth in length of a bone was due to additions to its extremities.

FIG. 2.



Experimental necrosis. Early stage. (A) Living bone. (B) Granulation tissue. (C) Sequestrum.

FIG. 3.



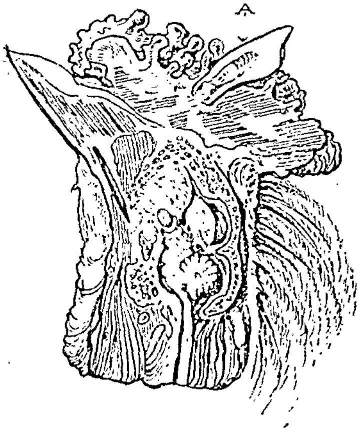
Experimental necrosis. Late stage. (A) Living bone. (B) Cavity containing sequestrum. (C) Sequestrum. (D) New bone growing over sequestrum.

Again, knowing of Belchier's discovery, that madder taken in the food is deposited in the bones, he fed young pigs upon food to which madder had been added. By giving and withholding the dye for varying periods and then killing the animals it was proved that madder-stained layers of bone were superimposed on unstained layers and that as new layers of bone were added to its surface the inner layer next to the marrow cavity was absorbed. He thus proved that the growth of a bone in thickness was due to the addition of new layers of bone to its outer surface and he recognised the occurrence of the physiological absorption of bone. He went further in this last observation, because he studied it in detail as it occurs in the shedding of a stag's antlers. He even anticipated some of the modern doctrines of internal secretions by noting the effect of castration in stunting the growths of the antlers. In one of Hunter's specimens, the head of a deer, in which the left antler is dwarfed, he tells us that from this animal the left testis had been removed.

In the second group of experiments Hunter demonstrated the process of inflammation, necrosis, sequestration, and the formation of an involucrum in a manner so perfect that his series of specimens stand to-day unique among our pathological collection. No better instance, I think, exists of how badly his tongue and his pen served his hand and his brain than is afforded by the laboured and involved description of the inflammation and necrosis of bones contained in Volume I., Chapter 18, of his collected works edited by Palmer as compared with the simple eloquence afforded by the specimens from which his learning was drawn. Most of these specimens were obtained by applying the actual cautery to one or other bones of an ass. (Figs. 2 and 3.) Possibly this was the same animal the tendo Achillis of which was divided and its union studied and on which other more elaborate experiments were performed. If this was the case then Hunter's ass certainly deserves a place in history even more honourable than that of Balaam.

In the third group of experiments Hunter showed how animal tissues could be removed from their natural situation and grafted elsewhere. In the most striking of these he cut off the spur of a cock and implanted it into the vascular comb. The transplanted spur not only lived in its new environment but grew prodigiously. An even more startling experiment was that of implanting a human tooth into a cock's comb and noting that having taken to its new bed it became vascularised, so that an injection into the vessels of the cock passed into the tissues of the transplanted tooth. (Fig. 4.) He transplanted the spur of a hen into the leg of a cock and obtained perfect healing with good growth of the transplanted bone. (Fig. 5.) This, I believe, is the first instance of successful bone-grafting of which we have any record.

FIG. 4.



Tooth transplanted into cock's comb. (A) Tooth.

In Hunter's day it was not possible to carry out any but the most simple experiments with bones, because any deliberate exposure and cutting of bone was followed by septic inflammation. Since the advent of aseptic surgery, however, the bones have proved amenable both to experimental work as well as to surgical operations.

MACEWEN AND LATER WORKERS.

There have been added to the Museum two notable series of experimental specimens, the one by Sir William MacEwen and the other by the Jacksonian Essayist of 1913.

The one series is of great scientific and historical interest, because it really settled what may be called the battle of the periosteum once and for all.

Until MacEwen's work, the periosteum was regarded as the veritable matrix of the bone, chiefly because of the work of Ollier of Lyons. But MacEwen showed that bone could grow and live without periosteum and that the so-called periosteal new bone was merely bone which had grown into the periosteum from its basal attachment and that the periosteum is merely an inert limiting membrane. These ideas were at first scouted by American and continental workers, but that they have now been converted is proved by the words of Leriche, Ollier's most brilliant pupil. "An area of ready ossification, the periosteum is not a specific organ of osteogenesis," and "the functional characteristic of periosteum appears to reside in the imitation of ossification."

Quite recently Cowan, an American worker, has shown that not only does the periosteum not produce new bone, but that it is one of the chief agents in preventing the union of fractures, by its capacity of forming dense fibrous tissue, which is apt to grow between the fragments and so hinder the union of the callus which these produce.

But the ultimate mystic problem of how bone is laid down and again taken up is not only still far from solution but seems now to us much more complex than it was in Hunter's day. We know a little of some of the distant forces which determine how much bone shall be laid down or to what size or to what density it shall grow.

We know that the ductless glands, the pituitary, the thyroid, the parathyroid, the ovaries have some influence on the growth of the skeleton, that food elements which can neither be isolated nor analysed, the vitamins, may determine its density, and most mysterious of all, that not only can sunlight cause bone to grow but that this sun power can be first given to the food and by this transferred to the bones.

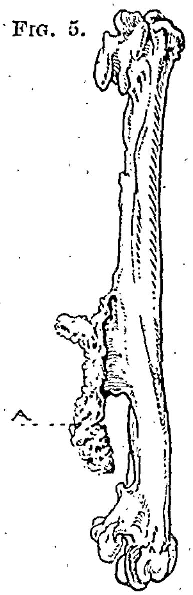
In fact the whole bewildering chapter in physiology called calcium metabolism appears to concern itself with all aspects of life and growth. But even the simple facts of the relationship between bone salts and bone cells are still matters of doubt and dispute. That animal tissues can be grafted was proved by Hunter, but the exact changes which take place in this process are most difficult to understand or explain.

Hunter took it for granted when he transplanted a human tooth into a cock's comb and it remained in organic connexion, allowing injection from the bird's vessels to permeate its tissues, that the tooth had become a living part of the cock's tissues. The modern view, however, would be that the vascularisation was only that of granulation tissue, by which the foreign tooth would have been eaten away and destroyed.

BONE-PLATING AND BONE-GRAFTING.

As I have said before, no practical advantages could have followed in Hunter's time from his grafting experiments. But in the modern era of aseptic surgery bone-grafting has become an everyday method of repairing fractures and of making good defects in the bones. For a time, it is true, the possibility of suture and fixation of bones by metallic substances, wire, plates, screws, and the like absorbed the attention of surgeons. But both clinical experience and experimental work soon showed the drawbacks and limitations of the use of metal substances and proved the great possibilities of grafting with bone tissue.

FIG. 5.



Bony spur grafted into leg bone of a fowl. (A) Spur.

The Jacksonian specimens illustrate many of these points, of which the following may be mentioned as the most important.

Any metal substance, whether wire or screw, exerting firm pressure upon living bone, causes either necrosis, or else absorption of the bone, and therefore is to be regarded as essentially a hindrance to bone growth or repair. This bone destruction, whether by necrosis or absorption, is a vital and not a septic process, but it leads to conditions very favourable to the latter. When, however, metallic fixation is efficient and bone union occurs there is produced in the end a reactive inflammation by which the foreign body becomes encased in a layer of dense new bone. Thus the method used clinically may and often does lead to painful osteitis which finally requires the removal of the offending metal.

In regard to bone-grafting the specimens under consideration give by no means a complete picture of the process. But they do illustrate two points of cardinal importance. The survival and functional union of the graft to the host bone depends essentially upon perfect contact and adequate fixation between the graft and the host. No living graft, however carefully cut even from the same animal, will survive or function if it is laid loosely into the tissues of the host. In other words, the graft manifests no innate vitality of its own. Further, if two small grafts taken, one of living autogenous bone, the other of dead, boiled bone, be fixed firmly in the shape of pegs into holes bored in the living host bone, then at the end of six weeks both will have grown in place and neither naked-eye nor microscopical examination can detect any difference. Dense bone when transplanted always dies, in the sense that its cell spaces and vascular channels become empty. It is then invaded by new vessels and inhabited by new bone cells provided by the tissues of the host. From this it follows that in many cases it is just as good to use dead bone in the first place and to trust to the activity of the host's tissues to vascularise and vivify it. Of this I shall show you a convincing proof presently. But it would be going too far to assert that the living autogenous graft has no advantage over the dead one. Certainly when a gap in a bone has to be bridged the living graft becomes a vital and growing part of the skeleton much more surely and more quickly than does a dead graft. Therefore in such cases as making good the gap left by the destruction of the whole diaphysis by osteomyelitis or the fixation of a tuberculous spine by the insertion of a tibial graft—a suggestion which we owe to the genius of an American colleague Dr. Albee—it is better to use the living bone taken from the patient himself. Whether this superiority of the live graft is due to the survival of superficial cells or to its more ready permeability by the host blood-vessels we do not know—but it is certainly not due to the survival of the graft as a living entity.

In the beautiful specimen lately presented to the Museum of a double bone-graft of the spine, obtained three months after the grafting operation, the grafts are seen to be in close vital union with the vertebræ. (Fig. 6.) But it is evident that the great vascularity of the grafts represents a new process of permeation and invasion by new blood-vessels, as the tibial crests from which they were taken contain no such blood channels.

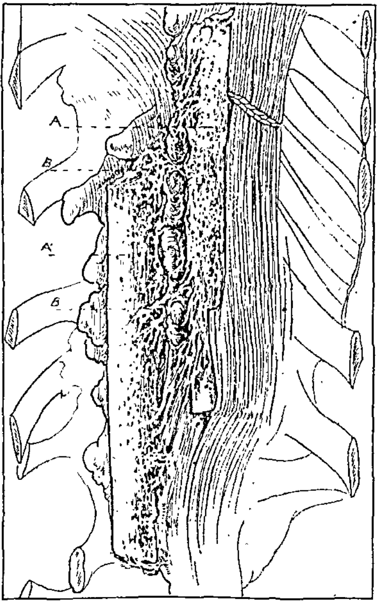
Probably I have raised in the minds of many of my hearers a feeling of scepticism about the possibilities of dead bones being capable of functioning as real vital grafts—vital, that is to say, in the sense that they become an integral part of the living skeleton.

Therefore I will venture to give you three illustrations, which I am happy to say are not dead specimens in bottles, but living healthy people.

The first is from a lady of 39, who had an ununited fracture of the neck of the femur of two years' duration. The bone was mended by exposing the hip-joint and nailing the head of the bone to the neck after the former had been dislocated. For this purpose a nail made of dead bone cut from a stag's antler and 3 in. long and ⅜ in. thick was used. She made a rapid and complete recovery and to-day, three years after the operation, it is impossible to detect from her active movements which of the hips has been injured. The X rays show very well how the bone nail first merely held the broken neck of the femur together (Fig. 7 A, B, C, D), then slowly but surely became incorporated into the living skeleton.

The second instance is in a man of 25, who at the time of the operation was 18. He had developed fibrocystic disease in the upper part of the left femur, which had become reduced to a mere shell of bone, causing a definite aching pain, premonitory of a spontaneous fracture. The exact nature of the condition was revealed by a preliminary operation in which a mass of firm fibrous tissue was revealed occupying the whole cavity, shown by the X rays. An exact model of this cavity was prepared from a tooth of a walrus, which by its curve and size seemed just made for the purpose. The whole cavity in the bone was exposed by cutting a trap door from the back of the femur, the fibrous mass was removed in one piece, and the ivory graft inserted. (Fig. 8 A, B.) There it remains to this day, surrounded but not replaced by the human bone, the dense ivory having proved resistant to penetration by new blood-vessels. The patient, a quarry-man, has been in good health and active work ever since. It is to me a happy thought that whilst Hunter was able to graft a tooth into a cock's comb 150 years ago, we have succeeded in implanting a walrus tooth into a man's leg in such a way as to form an integral part of his skeleton.

FIG. 6.



Autogenous tibial graft into human spine. (AA') Grafts. (B) New bone growing into grafts.

The third instance is perhaps the most instructive of all, because the dead graft was made to bridge a gap and has been associated with very active growth of a long bone. The boy as he then was, 10 years ago, between the ages of 7 and 10, had broken the right humerus four times, *usually as the result of trivial* violence. The X rays showed a cyst in the middle of the shaft of the bone. (Fig. 9 A.) The whole thickness of the affected portion of the bone was cut out for a length of three inches by a subperiosteal resection and you see the specimen thus obtained. (Fig. 9 B.) The gap was made good by thrusting a long piece of beef bone into each fragment and then bolting together the projecting ends of the grafts. Each graft had had many small drill holes made into it, in order to facilitate its penetration by living tissues. He made a smooth recovery without the use of any splint and was able to return to the dangerous environment of public school life six weeks later. The X ray pictures will show you how the beef bone has remained in place for ten years, becoming gradually merged, especially at the ends in the structure of the human bone. (Fig. 9 C, D.) That this bone has suffered no diminution of growth from its invasion by an ox bone is evident from the pictures but that you may be finally convinced of this I have brought the gentleman himself to show you, and you will admit that the addition of a piece of beef bone to his anatomy has not interfered with his growth. (He is now 6 ft. 2 in. and an undergraduate at the University.)

I have selected the study which Hunter made of bones and some of the things which have arisen from it as an example of his work, chiefly because it has not been touched upon by any of my predecessors and also because it is most familiar to myself, and this leads me to my first observation about Hunter as a great man. Think of it!

Seventy-five orations about one man and his work and still there is left a great subject almost untouched.

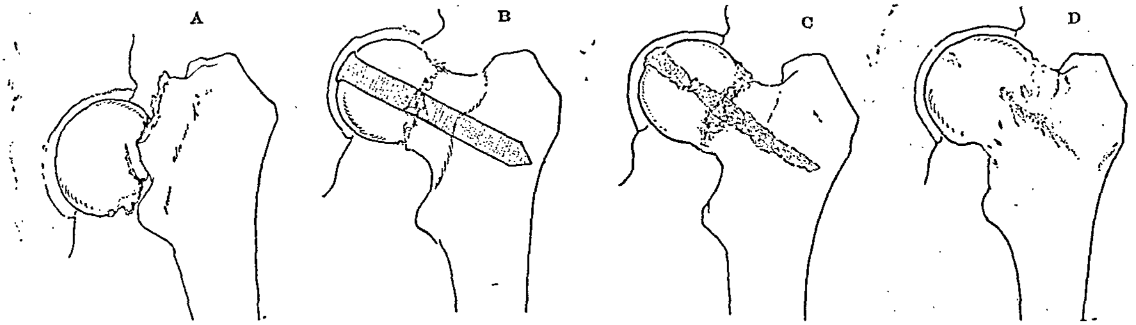
HUNTER AS A WORKER.

The first, but I will not say the greatest claim, which Hunter makes to be regarded as a veritable giant among men is his capacity and enthusiasm for work. He came as a young man from Scotland and began his life in London; making anatomical preparations in the school of his elder brother, William, he then taught anatomy and got himself qualified after working at Chelsea, St. Bartholomew's, and St. George's Hospitals. He was already deeply engaged in scientific research work chiefly in dissecting all the animals he could get. His health threatening to break down, he applied for and obtained a military surgeon's post and served for three years in Belle Isle and on the Peninsula.

On his return to London, his practice having vanished, he began strenuous work in dissecting, describing, and collecting specimens, which was the beginning of the present Museum. He became a surgeon to St. George's Hospital, he lectured on anatomy and surgery. He acquired a great and prosperous practice, and with its proceeds bought a country place at Earls Court in which he collected a veritable menagerie of wild animals and continued with his experiments. He became the Deputy Surgeon-General of the Army Medical Service. He had been for a long time a Fellow of the Royal Society and was already engaged in writing and contributing scientific papers for that learned body. Before he reached the zenith of his fame he had begun to suffer from attacks of angina pectoris, all the symptoms of which he relates with vivid exactitude.

His whole day being taken up with his practice and his teaching and his body racked with an ever-progressive disease, his last thought was of seeking rest or repose. On the contrary, his passion for work kept him up until midnight writing and awakened him again at four in the morning when he settled down to his dissecting. If a stranger wrote to him, wishing to see his work and profering an introduction from another distinguished surgeon or scientist, Hunter would name 5 A.M. as a suitable hour for an appointment! This all sounds incredible but its truth is vouched for by many witnesses, including Hunter's arch-enemy, the notorious Jesse Foot.

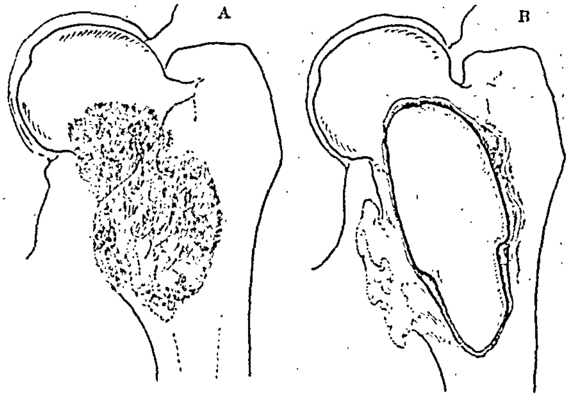
FIG. 7.



Dead graft in human femur. (A) Before operation. (B) Two months after operation. (C) One year after. (D) Two years after.

But in addition to witnesses from the past we have the convincing evidence afforded by 13,600 specimens in the Museum. It is not easy to grasp in a moment the significance of these figures. Hunter began his work at the age of 20 and died at 65. Allowing then full 45 years and 300 working days in each we have the total of 13,500 days with 13,600 specimens collected, or an average of one specimen for every day of his life. Many of these necessitated experiment or elaborate dissection, and he also left many folios of drawings, notes, and descriptions, besides those destroyed by Home and the 55 papers or treatises written by Hunter or prepared from his notes after his death.

FIG. 8.



Ivory graft in human femur. (A) Femur before operation showing fibrocystic disease. (B) Disease excised and cavity filled by ivory tooth seven years later.

A few people there may be, but very few who in intellectual pursuits really do work hard, but how many of these continue their self-imposed slavery right up to the end of their lives, even when fame and fortune have smiled upon them?

Hunter knew full well that he was suffering from a mortal disease, for he told a friend that his life was at the mercy of any rascal who chose to anger him and yet he went on at full pressure to the day of his death, when his own prediction came true and some colleague giving him the lie in the board room of St. George's Hospital he felt that the fatal blow had been struck and expired in the arms of Dr. Robertson.

HUNTER AS A SEEKER.

And this brings me to the next point which unhesitatingly may be said to be his chief claim to greatness. And this is the driving force which lay behind his work. Hunter was desperately in earnest. He was inspired by a vision of the mystery of life, which called him on and ever onwards, trying, experimenting, asking and seeking to know something of the truth of life and nature. "No man adequate to do anything, but is first of all in right earnest about it; what I call a sincere man. I should say sincerity, a deep great, genuine sincerity is the first characteristic of all men in any way heroic." That sentence of Carlyle's I take as literally applicable to our hero.

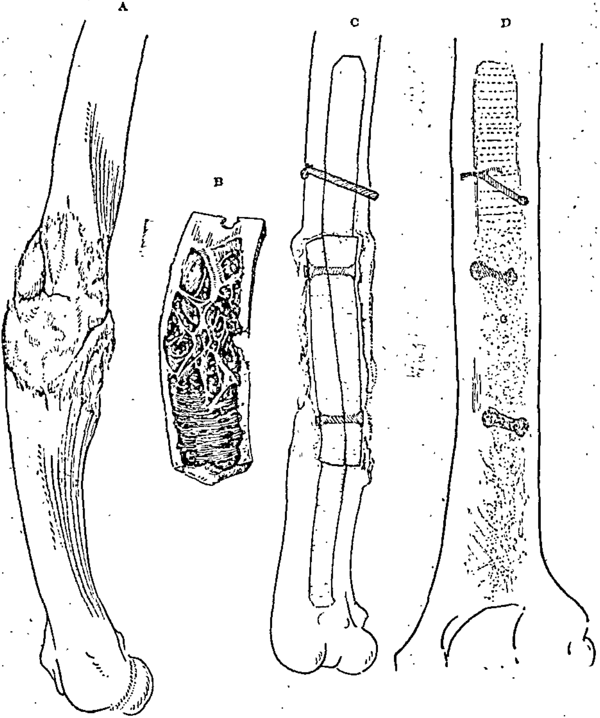
Nothing serves better to illustrate Hunter's desperate enthusiasm for research than his own deliberate inoculation of himself with disease. Unhappily this experiment was only too successful, though he himself failed to understand what has been so amply demonstrated by others that this disease, when it had apparently disappeared, laid relentless hold upon his blood-vessels and led to angina and to his tragic death.

It has been many times claimed that Hunter's secret lay in his having adopted the Baconian or inductive philosophy. But others have justly remarked that he often allowed himself to lapse back into the deductive method and that whenever he did this he wandered from the path of truth. It is highly improbable that he ever consciously adopted any philosophic system. He just went straight to Nature and demanding to know the answer to her riddles he thought nothing of giving his fortune and his life as a price for his knowledge.

In biological science Hunter was the greatest seeker the world has ever known, though by no means the greatest finder. It was his desperate earnestness in seeking and not merely the products of his research which then and now rivets men's attention. It was an arresting spectacle to see a Scotchman spending £70,000 in collecting specimens which had no intrinsic value. It was his supernatural faith that there was in Nature something worth seeking, which made other men follow his lead. The mere sight of a man earnestly gazing at some object in the street is enough to draw a crowd who will endeavour to find out what all are looking for. The pioneer who refuses to be satisfied with the bare tillage of the surface soil, worn poor by many generations of cultivators and convinced that a rich vein of gold is to be had for the digging, spends all his energies, his fortune and his life, in delving into the earth for buried treasure—who brings up many strange things, which at first only a few know to be auriferous ore—this is the man whose faith and enthusiasm compel others to follow. The pioneer does not himself, may be, find the largest nugget, or the purest gold, but he shows where gold may be found and how to find it.

Such a pioneer was Hunter and to Lister coming after him was accorded the good fortune to bring to light the most precious treasure that the surgeon-digger has ever given to his fellow men. It was John Hunter's faith and vision which raised surgery from the level of a craft and art to that of a science, and which has proved an inspiration to his followers. "For consider," as Carlyle says, "what mere time will do in such cases; how if a man was great when living, he becomes tenfold greater when dead."

FIG. 9.



Dead graft in human humerus. (A) Humerus before operation showing fibrocystic disease. (B) Portion of humerus excised. (C) Humerus reconstructed with beef bone, three months after operation. (D) Same case ten years after operation.

HIS HUMAN FRAILTIES.

The wonderful influence which Hunter exerted upon contemporary thought is made much more remarkable when we consider his many shortcomings and frailties.

He was gifted neither with learning nor eloquence. Of his writings I am almost tempted to quote what Carlyle says of Mahomet's Koran: "I must say it is as toilsome reading as I ever undertook. A wearisome, confused jumble, crude, incondite; endless iteration, long-windedness, entanglement." I sometimes wonder whether his brother-in-law, who afterwards became Sir Everard Home, the first President of the Royal College of Surgeons, deserves all the obliquy which has been heaped upon him for taking a cartload of Hunter's unpublished writings away with him and quietly destroying them, after he had extracted so much learning from them as by papers contributed by himself to the Royal Society, earned him a Fellowship in that body.

Although Hunter lectured for many years he found it a painful task and often took laudanum beforehand to quiet his discomforture. He had none of the classic learning considered essential for a scholar in his day, and even when he had a chance of acquiring it at Oxford he impatiently threw it aside, saying that he would rather learn from living Nature than from dead languages.

Even in those uncouth days Hunter was a rough customer. He was always quarrelling—whether with fellow officers in his military service or with his own brother, or other workers at home. He bursts into his wife's drawing-room and addresses her visitors: "I knew nothing of this kick-up, I ought to have been informed of it beforehand, but as I am now returned home to study I hope the present company will retire." It seemed that he must quarrel even to the end, even though it cost him his life.

If it should seem strange to mention these human frailties when speaking of one who was truly a hero, if ever there was one, I do it deliberately in order to emphasise that Hunter owed his influence to the greatness of his work, the almost blinding sincerity of his vision, and to his unquenchable enthusiasm, rather than to any charm of manner, or polish of language. I must quote Carlyle again when he says: "On the whole we make too much of faults; the details of the business hide the centre of it. Faults? The greatest of faults, I should say, is to be conscious of none."

His Heritage and Inspiration.

To the whole surgical world who have come after him Hunter's most priceless bequests have been his inspiration and his heritage. The heritage is here as the most wonderful museum of its kind in the world, the inspiration is impossible to limit or define.

We know that Hunter's experimental methods laid the foundations of modern physiology and pathology. He taught us to seek out the relations between structure and function in the normal tissues and between disorder and disease in the morbid. In his collection of animals and of fossils and his observations on development with its parallelism between the growth of the individual and the elaboration of the race, he came very near to the Darwinian theory of evolution. His methods, closely followed by Lister, were the basis of the discovery of the antiseptic treatment of wounds. "Worship of a hero is transcendent admiration of a great man." The great turbulent heroic soul of Hunter has never lacked this worship, or else these 76 Orations have been poor sham mockeries.

Even if we admit that orations are but empty words, there exists a far more vital evidence that the torch of inspired enthusiasm has been faithfully handed down from his day until now.

First, there was that dear old man Clift, who like a watch dog guarded his master's treasures after his death, when it seemed that nobody wanted them. For seven years he lived on 7*s*. a week, whilst he kept his trust and then later became the first formal custodian of the Museum. The watch dog growled and showed his teeth, but alas could do no more when his master's precious papers, many of which Clift had himself helped to write, were carted away and secretly destroyed by Home.

Clift's daughter married Richard Owen, who succeeded him in the guardianship of the Hunter Museum and became the greatest palæontologist and comparative anatomist of his day. He was later transferred to the Natural History Museum at South Kensington. Owen was followed by Paget, a most notable torchbearer, whose ceaseless labours added so much to surgical pathology and whose silver-tongued eloquence is remembered by many now living.

Then came the greatest of Hunter's followers, Lister, whose name is held in honour all the world over as the one whose work has saved more lives and suffering than have been sacrificed by war. Lister, it is true, never held high office in this College, though he was a Member of Council for eight years. His gentle soul did not love fighting with his detractors, and he preferred to pursue his quiet research in the laboratory and at the bedside.

And lastly we are fortunate in having to-day, in the person of our beloved Curator, Sir Arthur Keith, one on whom the mantle of John Hunter seems perfectly to rest, the depth of whose learning and the eloquence of whose tongue fits him so well to be the guardian of Hunter's heritage and the exponent of Hunter's inspiration.

Hunter may truly be said to have raised the idea of the scientific pursuit of truth to the level of that compelling influence in men's lives which is called religion. For he had a vivid faith in his quest, an unquenchable enthusiasm for his ideal; he left an inspiration for all who come after him and a real hero for us to worship.

PSITTACOSIS.

A FURTHER ACCOUNT OF CASES OF HUMAN INFECTION.*

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With Bacteriological Reports by

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In a recent communication[1] I published a brief review of psittacosis and described four cases of human infection that had come to my notice. My reason for returning so soon to the subject is that I have since met with no less than 17 further cases, which are recorded fully below as Cases 5–21. Five of them I myself did not see, but the clinical details leave no doubt of the diagnosis. Of the remaining 12, two (Cases 6 and 7) were not sufficiently clear to warrant a final opinion, but I regard them as probable instances of mild infection.

The fact that so many cases, in so short a time, have come to the notice of one physician seems to justify the tentative opinion that I expressed previously, that sickness of this type is by no means rare. It is true that in Cases 5, 6, and 7 I was consulted as a result of the publicity given to my first paper by a daily newspaper, but most of the others occurred in the ordinary course of practice, and I saw them as unsolved problems of obscure pyrexia. In several instances a fairly confident diagnosis was made on purely clinical grounds, a history of contact with sick birds being elicited only later.

From various lay and medical sources I have received accounts of obscure illnesses which give reasonable grounds for the belief that they were in fact due to psittacosis, but I have thought it wise not to publish these.

A Group of Three Cases.

For information and help in preparing the record of Cases 5, 6, and 7 I am indebted to Dr. W. Geoffrey Shaw, of Weaverham, Cheshire, who had charge of them, and to Dr. W. H. Grace, pathologist to the Royal Infirmary, Chester, who saw them in consultation.

On June 27th, 1929, Mrs. A bought a young parrot from a dealer in London. The day after its arrival in her home the bird appeared to have a "cold"; a little later the feathers became ruffled and were shed freely and there was a frothy discharge from the nose. Diarrhœa set in on July 20th and on the 22nd the parrot died. The bird had been much petted by Mr. A, who had trained it to walk up his arm and take a lump of sugar from between his lips, and his little son had often played with it. Mrs. A cared for it during the later stages of its illness. On the day that the parrot died Mr. A (CASE 5), who had appeared unwell for two days previously, collapsed at his work and on returning home was found to have a temperature of 103° F. As Dr. Shaw could find nothing to account for the fever, he invited Dr. Grace to see the patient the following day, and the latter has kindly sent me the following report.

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* The greater part of this communication was read to a meeting of the Royal Society of Medicine, Section of Medicine, on Jan. 28th, 1930. An account of four additional cases, and a discussion of the ætiology in the light of the investigations published since then, is now incorporated.

"When I first saw him he had a distinctly high temperature and felt ill. Clinically, to me, he did not quite fit in with a case of typhoid or paratyphoid; the onset was rather sudden—although I tried to persuade myself that he had been walking about for some time with a pyrexia and had refused to give in—and he seemed to be more suddenly ill that one usually finds in one of the typhoid group infections. When I saw him he was almost on the point of a rigor, his conjunctivæ were very injected and he was more brightly spoken than one usually sees in typhoid or paratyphoid infection. I could not see any spots, nor could I feel his spleen or find anything abnormal in the chest. I tested some of his serum with the Medical Research standard agglutinable emulsions of typhoid and paratyphoid A and B. To my surprise he gave quite a quick and complete agglutination of the *B. typhosus* up to 1 : 300 and a slight agglutination of the *B. paratyphosus* A and B to 1 : 10. With these results I was prepared to throw overboard my clinical impressions and, for the moment, call the case one of pure typhoid and advise its treatment accordingly. I have since examined fæces, urine, blood, the parrot's perch, and scrapings from the bottom of the parrot's cage, but in no case have I found a non-lactose fermenter."

Mrs. A, from the very beginning of her husband's illness, had insisted that he had been infected from the parrot and searched any literature that she could find bearing on diseases of birds that might be transmitted to men; she had no success, however, until she came across a paragraph in a daily newspaper referring to my first paper in THE LANCET, which she immediately obtained. In these circumstances I saw Mr. A in consultation with Dr. Shaw on July 28th. For the previous six days his temperature had been constantly high, between 103° and 104° F., but his pulse-rate had remained slow; it never reached 100 per minute and was usually between 80 and 90. He was flushed and sweating profusely and complained of intense headache: he was mentally clear, but at times he had been mildly delirious. An irritable cough had developed two days previously, and as I entered his room he expectorated some rusty sputum, but this never recurred.

On examination I found, at the right base in the axillary line, some fine crepitant râles and a patch of rather doubtful faint tubular breath sounds. Dr. Shaw and I agreed that at that stage he looked rather like a case of pneumonia. There was no serious abdominal distension; the spleen was not palpable and there were no typhoid spots, merely a few sudamina. The bowels were costive. A blood culture I made at the time proved sterile (as did Dr. Grace's) and I recovered nothing of significance from a post-nasal swab. The piece of rusty sputum that I took away with me yielded a Gram-negative, non-lactose fermenting bacillus, but I was never able to get it in pure culture and eventually it died out.

Later Dr. Shaw sent me the following report on the progress of this case: "As far as the clinical aspect was concerned, he appeared to be a typical typhoid. The temperature curve reached its maximum at the beginning of the second week, then remained at a steady 100°–101°, and in the third week came down by lysis. During the whole febrile period he complained of intense headache and had troublesome cough, with scanty muco-purulent sputum. The tongue was thickly furred and the bowels were obstinately constipated throughout. The small spot in the right lung, where you suspected a commencing broncho-pneumonia, did not extend and there were no further pneumonic signs. The pulse-rate remained slow (about 80–85) and of good tension throughout the illness. His convalescence was uneventful."

Two or three days before Mr. A became seriously ill, his son (CASE 6), aged 7 years, fell sick with an acute febrile attack (on one occasion the mother found a temperature of 103°). After four or five days the temperature became normal, but it continued to go up to 99° each evening for a fortnight. During that fortnight he always declared that he felt perfectly well; he certainly had no symptoms of any kind except constipation, but looked rather pale and "washed-out." I examined this boy with Dr. Shaw on July 28th and agreed with him that there were no abnormal physical signs. It is probable that this child was infected from the bird, with which he had been in close contact, for he became ill at about the same time as his father and it is well known that in children infections of the typhoid group run a much milder course than they do in the adult.

Mrs. A (CASE 7) had a remarkable experience. On July 25th, when her husband had been in bed for three days, she complained of backache and of feeling ill. On the following day, in view of Mr. A's positive Widal reaction, she was given a protective dose of T.A.B. vaccine (500 millions of *B. typhosus* and 250 millions each of *B. paratyphosus* A and B). One and a half hours after the inoculation she had a rigor and became collapsed; her temperature was moderately raised during the next four days and she had a slight cough with mucoid expectoration. Her subsequent progress was uneventful. At the same time that she was inoculated her maid received a similar dose, with the usual consequence of a slight feeling of illness and a trivial temperature 24 hours later.

The very severe reaction shown by Mrs. A to the vaccine suggests that she was sensitised to an organism of the typhoid group, and it may be that at the time of inoculation she was incubating an infection similar to that of her husband. If this was so, the vaccine cut short the attack in a remarkable way.

Further Clinical Histories and Bacteriological Findings.

CASE 8.—On August 12th, 1929, Mrs. B, a lady of middle age and the wife of a doctor, took charge of a young parrot which was confided to her care by some friends because it had become sick and she was known to be interested in birds. During the next fortnight the parrot became extremely ill, with vomiting and profuse diarrhœa of a very offensive kind; nevertheless Mrs. B tended it assiduously and managed to restore it to its owners alive on August 26th, but it died three days later. On Sept. 1st, five days after parting with the parrot, she developed a headache and felt shivery; her temperature was found to be 100° and she went to bed. During the next five days the fever steadily increased to 103·5 and the headache became more severe; it was mainly occipital in distribution but sometimes diffuse. There was some diarrhœa during the first three days and she frequently vomited, particularly after taking medicine.

I saw her first on Sept. 6th, in consultation with Dr. T. M. Tibbetts of Stourbridge. The temperature was nearly 104° but the pulse was slow, just over 90 per minute; she complained of intense headache but was mentally quite clear and bright. Some sharp crackling râles were heard in the third left intercostal space, but apart from this, a dirty tongue, and moderate abdominal distension, physical examination was negative. I was at once struck by the resemblance of this case to the one I had seen a year previously and on inquiry elicited the history of contact with the sick parrot, which warranted a fairly confident diagnosis of psittacosis.

The next day the patient was admitted to the General Hospital; she had slight epistaxis just before she left her home. During the next 13 days the temperature slowly fell by lysis from 104° to normal. The pulse-rate hardly ever reached 100 and respiration was never seriously hurried. Despite the gradual fall in the temperature the general condition appeared to become worse, and she was very gravely ill during the whole of the febrile period and for a week afterwards. The signs in the left lung gradually extended. On Sept. 8th rather coarse crepitant râles were heard over the whole of the left upper lobe in front; on Sept. 9th there was definite dullness above the left breast, reaching to the axilla, and crepitations were heard at the back. Tubular breath sounds were found on Sept. 10th in the left axilla, and coarse crepitant râles were present throughout the whole of the left lung. By Sept. 13th the breath sounds in the left lung became faint and were hardly audible on the 16th; during the four following days the left lung was almost completely silent and the percussion note over it was dull. A lung puncture on Sept. 18th proved the absence of fluid. Subsequently a few crepitations appeared in the lung and the physical signs eventually cleared up by Sept. 30th, when the temperature had been normal for ten days. Cough was never severe, but she had a distressing hiccough for some days. There was practically no expectoration. The spleen was never palpable and there were no true typhoid spots (though one suspicious spot was noticed on the flank in the early stages). Occasionally she had diarrhœa and passed loose greenish stools, but this may have been due in part to the measures adopted to relieve abdominal distension, which was of extraordinary severity. She often became acutely distended in the course of an hour or so; injections of pituitrin and eserine with turpentine enemata generally produced immediate relief with the passage of vast quantities of flatus and a visible diminution in the size of the abdomen, but within an hour she was frequently found to be as tense as before. On one occasion the passage of a tube led to the escape of so great a quantity of flatus that she had a serious collapse, similar to that sometimes seen during operations for the relief of acute intestinal obstruction. Subsequently, to avoid this, the flatus tube was clamped and the gas allowed to escape slowly. On Sept. 11th she became very drowsy and on the 13th completely stuporose; for six days she never spoke and seemed entirely oblivious to her surroundings. Her face had a mask-like immobility, with a curious retraction of the upper eyelids, so that a wide rim of sclerotic could be seen above the pupils; blinking occurred very seldom. At times slight weakness of the sixth or seventh cranial nerves on the right side was suspected, and very severe bilateral ankle-clonus was present for several days. The tendon reflexes were exaggerated, and on one occasion an extensor plantar response was found on the right side. The fundi were normal, but for one day the right pupil was much larger than the left, though reactions to light were brisk in both. Incontinence was frequent. Her general appearance was suggestive of parkinsonism, and Dr. Stanley Barnes, who saw her with me, thought there was no doubt of it. As she slowly recovered from the stuporose condition she was completely disorientated in place and time, and later on she told me that she had no recollection at all of this period of her illness. The incontinence persisted for some days after the disappearance of her other nervous symptoms, and three weeks after the temperature fell to normal her memory was found to be still impaired. Eventually she made a complete recovery.

Her husband received a protective injection of T.A.B. vaccine at my suggestion on Sept. 7th, and we gave her three small injections (about 7·5 c.cm. each) of his serum on the 15th, 19th, and 20th, but they appeared to have no appreciable effect on the course of her temperature. In view of the result of similar injections in Case 9, it is probable that so soon after his inoculation the husband had not accumulated sufficient antibodies to be of value.

Bacteriological Report.—Four specimens of fæces were examined. Those of Sept. 9th, 11th, and 18th yielded no non-lactose fermenters. That of the 12th yielded an organism giving gas only in glucose and lactose broth, acid and clot in milk, acid and gas in dulcite, maltose, and mannite, and no reaction in saccharose and inulin. The presence of acid and clot in milk culture renders it possible that this organism, which in some respects is rather like *B. aertrycke*, was in reality a lactose fermenter and, if that be so, all the four specimens of fæces gave negative results for *B. psittacosis.* The blood culture, taken on admission, was sterile, and a post-nasal swab yielded no non-lactose fermenters.

The urine (Sept. 7th) yielded an organism identified by its sugar reactions in 48 hours as *B. fæcalis alkaligenes.* Cultures from a lung puncture (Sept. 17th) produced an organism which, by the sugar tests, resembled *B. fæcalis alkaligenes*, but which was non-motile and so short that it was impossible to be certain whether it was truly a bacillus or a coccus.

B. psittacosis, then, was not found in fæces, urine, post-nasal swab, fluid from lung puncture, or blood. *B. fæcalis alkaligenes* was obtained from the urine (and possibly from the lung).

Agglutination tests against *B. typhosus*, *B. paratyphosus* A and B, salmonella (Mutton and Newport) on Sept. 8th and 10th (in the second week of illness) were completely negative. Serum taken on Sept. 19th, however, agglutinated 24-hour broth cultures of *B. psittacosis* (Perry) National Collection of Type Cultures 1 : 500 and organism *B. fæcalis alkaligenes* from the urine, broth culture 1 : 40, but there was no agglutination with *B. typhosus* or *B. paratyphosus* A or B. On Sept. 26th, a week later, another specimen of serum failed to agglutinate broth cultures of *B. psittacosis*, *B. fæcalis alkaligenes* or salmonella (Mutton), but with a suspension from an agar culture in normal saline it agglutinated *B. fæcalis alkaligenes* at 1 : 80. Saturation with either *B. psittacosis*, salmonella (Mutton), or *B. fæcalis alkaligenes* removed all the agglutination for *B. fæcalis alkaligenes.*

CASE 9.—A healthy Jewish girl of 26 played tennis throughout the day of Sept. 10th, which was hot and sunny. Shortly afterwards she complained of occipital headache and of feeling shivery, but for the next four days, although obviously ill and in spite of occasional vomiting and epistaxis (to which she was at times subject), she carried out her usual secretarial work. On Sept. 13th her temperature was found to be 101°, on the 14th it was 103°, and on the following day, when I first saw her in consultation with Dr. B. Herbert, it had risen to 105°. On the morning of Sept. 14th Dr. Herbert found a patch of dullness and faint breath sounds at the base of the right lung and was suspicious of early pneumonia, although he noticed that the respiration was not rapid and that the pulse-rate remained rather slow; it was recorded by a nurse as 104 to the minute, although it was nearer 120 during his examination. These slight signs at the right base cleared up in 24 hours, and Dr. Herbert asked me to see her, as the diagnosis remained doubtful. Her general condition was good, though she appeared seriously ill. She complained of occipital headache slight stiffness of the neck, and photophobia. Apart from trivial cervical rigidity and some sharp crepitations at the left base, physical examination yielded nothing of importance. In particular Kernig's sign was negative, the reflexes were normal, and the fundi were clear; there was no abdominal distension and the spleen was not palpable. There was no known tuberculosis in the family. The history of the onset—a steady rise in temperature, a slow pulse, headache and slight vomiting, and epistaxis—together with the discovery of crepitations at the left base (which had been preceded by questionable signs of early pneumonia on the right side), in the absence of splenic enlargement and any mental dullness, led me to suggest the possibility of psittacosis, although Dr. Herbert, who knew the family well, was fairly confident that contact with birds was unlikely.

Nevertheless, on inquiry we were told that on August 30th (11 days before the onset of illness) our patient's fiancé had made her a present of two love-birds, one of which at the time of purchase appeared to be off colour. The vendor, however, was confident that the bird would soon recover, but this cheerful prognosis proved to be incorrect, for it rapidly became worse and suffered from continuous diarrhœa; and a few days later, on the advice of a local bird fancier, it was placed in a separate cage apart from its mate. Despite the unpleasant nature of its disease, our patient continued to attend to the sick love-bird, and until she herself became ill no one else in the house did much for it; subsequently the bird was cared for by an elderly aunt (CASE 10), whose history is given below. The two love-birds, when Dr. Herbert and I inspected them, presented a remarkable contrast, for the sick one remained crouched and motionless on the floor of its cage with its feathers bedraggled and ruffled; its breathing was obviously laboured and it frequently passed loose stools. Surprisingly enough, it often took food voraciously. The girl and both birds were removed at once to the General Hospital, where the sick bird was found dead in its cage the next morning. The other bird remained healthy.

For the following week the patient was very gravely ill, with a high continuous temperature, which occasionally reached 106°, and was nearly always above 104°, despite frequent sponging. The pulse-rate remained about 120, but towards the end of the week reached 130. The respiration-rate was about 30 for the first three days, but later rose to 50 to the minute.

On Sept. 17th my colleague, Dr. K. D. Wilkinson, saw her with me in consultation, and we found a small area of consolidation at the left base. The remainder of the physical examination was negative, apart from the presence of a few seborrhœic spots on the chest. The patient told us that these always became more prominent at menstruation, which began that day and ran a normal course. She was still mentally clear, had slight cough with scanty muco-purulent expectoration, and complained of flatulence and difficulty in breathing. There was no abdominal distension. During the next three days she became progressively worse; mentally she was dull and torpid, but never completely stuporose, although at times there was mild delirium. The cough varied and rarely distressed her; in general she lay absolutely motionless with a curious impassive appearance which immediately suggested a comparison with Case 8, in whom this feature was much more prominent. This strange passivity (she was "highly strung" by temperament), in mild degree, persisted for some days after convalescence had begun. The signs in the lungs extended rapidly, and by Sept. 21st it was clear that both lower lobes were entirely consolidated; the percussion note was markedly impaired and tubular breath sounds were well heard over them. Respiration was rapid and shallow, and I think it is fair to say that most physicians at this stage would have been content with a diagnosis of lobar pneumonia if the history of the unusual onset and of the contact with the love-birds had not been available. The physical signs in the chest persisted unchanged for another two days; on the 21st a lung puncture was done on the right side for bacteriological purposes and about 3 c.cm. of rusty fluid was withdrawn from the pleura, but no more could be obtained. On the 23rd there was almost complete silence over the bases behind. The percussion note did not suggest fluid, and I believe that there was at this stage massive consolidation similar to that in Case 8. The breath sounds were faintly audible again on the 24th and were still tubular, but for the next two or three days the lower lobes were almost silent. Subsequently resolution took place fairly rapidly. On the 24th my colleague, Dr. Stanley Barnes, examined her and said that "she would do well for a Parkinson," a suggestion with which Dr. T. L. Hardy agreed when he saw her four days later. Throughout her illness the alimentary symptoms were slight. At one time there was unusual salivation—she seemed in her early torpid period to derive some comfort from constantly blowing bubbles of saliva from her lips—but this cleared up after four days. Distension was never marked, though she passed flatus freely; the stools were of a curious greenish colour and frequently loose. Vomiting occurred only very occasionally and she took nourishment well throughout. The urine remained normal. Apart from the curious parkinsonian appearance, no abnormal nervous signs were discovered. The same plan of treatment was followed in this case as had been tried in Case 8. On Sept. 19th and 20th she received two doses of serum from relatives who had been inoculated with T.A.B. vaccine on Sept. 10th. Neither of these injections had the slightest effect on her, and it seemed that insufficient time had elapsed to allow of the production of antibodies. The husband of the other patient (Case 8), who had been similarly inoculated on Sept. 7th, kindly allowed us to use his serum, and an intramuscular injection on the 21st of 7·5 c.cm. was followed by a drop of over three degrees in the temperature. After 36 hours the fever rose again to 104° and a similar injection was followed by a like result; further doses were given at daily intervals and appeared to bring the illness to a dramatic end some days earlier than might have been expected. The injections were prepared quite simply by allowing 20 c.cm. of the donor's blood to clot in a sterile tube, and as much serum as separated was used without any special treatment. Fresh blood was taken on each occasion for the following day's injection.

Bacteriological Report.—Neither sputum, urine, blood, nor fæces yielded any organism resembling *B. psittacosis*. Serum collected on Sept. 16th agglutinated both cultures of *B. psittacosis* (National Collection of Type Cultures) at 1 : 900 (not 1 : 1000) dilution, and also a broth culture of salmonella (Mutton) at 1 : 500 (not 1 : 700). An Oxford suspension of salmonella (Mutton) was agglutinated at 1 : 125. Negative results were obtained with salmonella (Newport), *B. dysenteriæ* (Gaertner), *B. typhosus*, and *B. paratyphosus* A and B. A later specimen of blood, taken Oct. 1st, failed to agglutinate broth cultures of *B. psittacosis*, salmonella (Mutton), or *B. fæcalis alkaligenes*, but agglutinated suspensions in saline solution of *B. psittacosis* 1 : 20, salmonella (Mutton) 1 : 40, and *B. fæcalis alkaligenes* 1 : 20. Saturation with *B. psittacosis* or with salmonella (Mutton) left the agglutination unchanged or even slightly improved for any one of the three organisms, but saturation with *B. fæcalis alkaligenes* removed all the agglutination for that organism and left it unchanged or improved for the other two. Serum collected on Nov. 8th, when the patient was convalescent, agglutinated similar suspensions of *B. psittacosis* and salmonella (Mutton) in rather higher dilution (up to 1 : 100) and an Oxford suspension of salmonella (Mutton) at 1 : 100. There was no agglutination with control normal serum.

CASE 10.—On Sept. 15th, 1929, as Dr. Herbert and I were leaving the house after our consultation on Case 9, we were told that the patient's aunt, who had cared for the sick lovebird for a few days, had become ill and had been sent to bed by her doctor with fever and bronchitis. She was admitted to the Selly Oak Hospital shortly afterwards with a slight temperature (about 100°) and signs of bronchitis and possible consolidation at the base of the right lung. As her condition did not appear grave and as her temperature soon fell to normal, she was transferred to the adjoining infirmary, but was brought back to the hospital when I told Mr. R. P. S. Kelman, the medical superintendent, of my suspicions of the possibility of psittacosis infection. Mr. Kelman was good enough to allow me to see this patient in the hospital on Sept. 21st. She was a feeble old lady of 73, with signs of emphysema and cardiovascular degeneration. A patch of consolidation was found at the right base, but her temperature was then normal; the respirations, however, were hurried—36 to the minute. Slight vaginal hæmorrhage of uncertain origin had occurred that morning and the urine contained albumin; nothing grossly wrong was found on pelvic examination. Dr. Hillier found that her blood serum agglutinated *B. psittacosis* strongly (up to 1 : 500 dilution) and she died a few days later, after developing a fresh patch of consolidation in the left axilla. No post-mortem examination was allowed. It is recognised that infections of the typhoid group in the elderly may follow an almost afebrile course, and in view of the history and positive agglutination this case may fairly be regarded as an instance of psittacosis.

CASE 11.—Dr. E. H. Alton of King's Norton, after reading my earlier communication on this subject, furnished me with the following account of a remarkable case that occurred in his practice.

Early in 1926 a middle-aged man returned to Birmingham from West Africa, bringing with him three young parrots, all of which, within a few days, sickened with diarrhœa and died. Almost immediately after the death of the last of the birds, the man himself, who had previously been in good health, became ill with continuous fever. At the end of a week he was seen in consultation by one of my colleagues at the General Hospital and a diagnosis of typhoid was suggested. A Widal test, however, proved negative. During the second week of illness extensive signs of pneumonia developed in the right lung, and he was again seen by the same consulting physician, who confirmed Dr. Alton's findings and thought the condition was probably due to an unusual influenzal infection. The fever persisted, and in the third week the man was almost continually unconscious. The physical signs in the right lung changed, and in place of well-marked tubular breathing the breath sounds became inaudible. Dr. Alton needled the chest several times, as he thought an effusion had developed, but never found fluid. He was so struck by the silence of the lung that he got his partner, Dr. J. A. Brown, to see the patient, and he also explored the chest with a negative result. The man died at about the end of the third week of illness. The spleen was never enlarged and there were no spots. At the time the possible significance of the contact with sick parrots was not appreciated, but the clinical history leaves no doubt that this was in fact a case of psittacosis.

CASE 12.—On Nov. 29th, in consultation with Dr. Smeeton Johnson, of Kidderminster, I saw, on three occasions, a man of middle age who had an illness that ran a course exactly similar to that of Cases 8 and 9, and my colleague, Dr. L. G. Parsons, who saw both these cases while they were in hospital and also Dr. Johnson's patient, agreed with me that they were clinically indistinguishable.

This man was a pigeon-fancier, and for years he had been daily in close contact with these birds, of which he had over a hundred in his own aviary. There was no definite history of contact with sick birds, but Prof. C. J. Lewis found that his blood gave a slightly positive agglutination for *B. psittacosis* and a negative result for all the other members of the typhoid and salmonella group; in addition the illness was brought to a dramatic end by the injection of serum from a man inoculated some weeks previously with T.A.B. vaccine, exactly as in Case 9. There was a history of a similar illness four or five years previously. The absence of sickness among any of the birds with which this patient was known to have come into contact raises the unpleasant possibility that this disease may be contracted from apparently healthy birds.

CASE 13.—On Nov. 23rd, 1929, a lady, aged 60, purchased a South American parrot which was noticed to be sick on its arrival in her home. The bird developed a nasal discharge, severe diarrhœa, and distressed breathing, and died on Dec. 8th. Two days later the lady herself became ill and was thought to have a cold. On the 13th her temperature was 104° and she had to stay in bed. I saw her first on Dec. 15th with Dr. W. J. Hirst, of Moseley. Her temperature was then 103°, but her pulse-rate was only 96. She complained of intense occipital headache radiating down the neck, but physical examination was quite negative, apart from the presence of a few scattered râles in the left lung. For the next two weeks she had a continuously high temperature, between 103° and 104°, and was often stuporose and completely incontinent. A troublesome cough was present throughout, without expectoration, and she had signs of diffuse bronchitis, but there was no definite consolidation. In the third week her temperature fell by lysis to normal for three days and her general condition improved slightly, but on the twenty-seventh day of her illness she relapsed and had a temperature varying between 99° and 101° for a fortnight; during this period there was definite consolidation at the right base. She now appears to be convalescent, but is mentally very emotional and unstable. Blood cultures taken on the fifth day of illness were sterile, and nothing of significance was recovered from the stools and urine in Prof. Lewis's laboratory. The agglutination reactions by Dr. E. Baylis Ash were as follows. On Dec. 15th (fifth day of illness) the reaction was completely negative to all the typhoid and salmonella group except *B. psittacosis* (Perry), with which there was a positive macroscopic result at a dilution 1 : 15 and microscopic 1 : 10. On Dec. 18th agglutination of *B. psittacosis* was present at 1 : 20 macroscopically and 1 : 40 microscopically. Salmonella (Mutton) was also agglutinated at 1 : 40 dilution, but all the others were still quite negative. On Jan. 17th (during the relapse) all the agglutination tests were quite negative.

Three small injections of serum from men inoculated with T.A.B. vaccine three months previously were given in the early stages of the illness and each was followed by a transient fall in the temperature, but it was not possible to arranged for continued treatment of this kind. In the later stages, after the positive agglutination results had been obtained, several daily injections were given of vaccine prepared from *B. psittacosis* cultures, but they had no influence on the disease.

CASE 14.—This patient was the husband of Case 13. On Dec. 17th, when his wife had been ill for one week, he received at my suggestion a prophylactic inoculation of T.A.B. vaccine (100 millions of each organism). Immediately afterwards he had intense pain at the site of injection, and an hour later had a rigor, vomited, and went to bed. For the next three weeks he had a moderate temperature (usually from 99° to 102°, but once reaching 104°), intense headache, and great prostration. The lower lobe of the right lung was consolidated one week after the onset of the illness, and there were signs of diffuse bronchitis, to which he had been subject for some years previously. Prof. W. H. Wynn saw him in consultation with Dr. Hirst and myself, and agreed with the diagnosis. *B. psittacosis* vaccine was also given in this case without effect. On Jan. 15th, when he was convalescent, his blood agglutinated salmonella (Mutton) (1·20 macroscopic and 1·40 microscopic) and *B. suipestifer* (1·20 macroscopic). Agglutination tests with all the other members of the typhoid and salmonella group (including *B. psittacosis*) were quite negative. This case ran a course exactly parallel with that of No. 7 of this series.

In connexion with these two cases it should be recorded that after the death of the first parrot a second similar bird was supplied by the dealer and placed in the same cage, which had been thoroughly scrubbed with lysol. This bird was taken to the University laboratory on Dec. 17th, and cultures were made from its nose and fæces with negative results. A few days later a nasal discharge developed, but there was no diarrhœa. The bird was killed on Dec. 20th, and a most exhaustive post-mortem examination showed that its condition was due to a streptococcal septicæmia. No non-lactose fermenting organisms were isolated from any of the organs and the parrot's blood failed to agglutinate the stock culture of *B. psittacosis* (Perry), and also the cocci isolated from the sputum of Case 14. It is clear that the illness of this parrot had no relation to the infection of the human cases.

A Second Group of Three Cases.

Cases 15, 16, and 17, all members of one family, were admitted to the General Hospital under my care at the request of Dr. Hugh Tibbits of Warwick. A parrot was bought on Dec. 19th, 1929, and died unexpectedly on Jan. 1st, 1930, without signs of previous illness apart from a questionable nasal discharge. Another parrot was obtained from the same dealer on Jan. 2nd, and this bird was noticed to be sick at the time of purchase and died on the following day.

CASE 15.—On Jan. 8th a woman of 51 complained of headache, drowsiness, and shivering, and she eventually had to take to her bed on the 12th. Dr. Tibbits saw her later and found signs of pneumonia, and sent her into hospital with the diagnosis of psittacosis on the 16th. On admission she was drowsy and apathetic; her temperature was 101° and the pulse-rate was about 100. The percussion note at the right base was dull, and breath sounds were entirely absent over the whole of the posterior aspect of the right lower lobe. Her temperature fell to normal in three days and remained so, except for trivial rises in the evening to about 99°, for a further four days, and her general condition improved. A few crepitations appeared in the silent area in the lung two days after admission, and breath sounds became audible. There was no cough or expectoration and no diarrhœa or vomiting. My house physician, Mr. Smallwood, found the spleen palpable on Jan. 22nd, but I could not feel it the following morning. A blood count showed a moderate leucocytosis (12,400 white cells with 83 per cent. polymorphonuclear leucocytes). Nothing of significance was recovered from cultures of the blood, urine, or fæces. Serum taken on Jan. 17th (the ninth day of illness) agglutinated *B. psittacosis* (Perry) strongly at 1 : 20 dilution and feebly at 1 : 50. There was also a feeble agglutination with salmonella (Mutton), but none with any of the typhoid or others of the salmonella group or with *B. fæcalis alkaligenes.*

CASE 16.—A man, aged 58, the husband of Case 15, was admitted on the same day as his wife—Jan. 16th. He had been ill for five days and almost constantly delirious for three. On admission he was excitable, mildly delirious, cyanosed, and obviously very ill. His temperature was 103°, his pulse-rate was 140, and there were signs of consolidation at the right base. He coughed a little, but there was no expectoration. The spleen was not palpable. The following day his general condition was worse; the right base was dull to percussion and breath sounds were absent; puncture of the chest yielded no fluid. A blood count showed a leucopenia (6000 white cells per c.mm.) A few hours later signs of consolidation were found in the left upper lobe and he died on the afternoon of Jan. 18th. There was no diarrhœa or vomiting. Cultures from the blood, fæces, and urine yielded nothing of significance, and there was no agglutination of any of the typhoid or salmonella group of organisms. A post-mortem examination was made 20 hours after death by Prof. G. Haswell Wilson; the following is the report:

"The body is that of a well-developed, somewhat obese man. There are no external morbid appearances. The pericardial sac is normal. The heart weighs 380 g. No lesion is found in the valves or cavities. The muscle is rather pale, but is not appreciably softened. The coronary arteries show slight patchy atheroma. The lungs are free from adhesions. A few minute petechial hæmorrhages are seen beneath the visceral pleura. There is no evidence of pleurisy except at the right base, where there is an area about half an inch in diameter covered by a thin pellicle of recent fibrinous exudate. The upper lobe of the left lung is completely consolidated, but the lung is not increased in size and is not marked by the ribs. The consolidated lung substance is of a dusky red colour and of a dry and almost crumbling consistence. There is no evidence of suppuration, and the appearances are quite unlike those of an ordinary lobar or broncho-pneumonia. The bronchi are congested and those of smaller size contain a small amount of turbid, blood-stained fluid, with no obvious muco-pus. The unconsolidated lung substance is poorly aerated, congested, and slightly œdematous. Similar changes are seen in the right lung, but on this side the consolidation involves part only of the lower lobe. At the edge of the consolidated area, just beneath the early fibrinous exudate on the pleura, there is a small area resembling ordinary broncho-pneumonia, with a small central bronchus from which muco-pus exudes on pressure.

"The peritoneum is normal. The liver, weighing 1500 g., is pale from cloudy swelling and slight fatty infiltration. The spleen, weighing 300 g., is enlarged and very soft. The pulp is intensely congested and is almost diffluent in consistence. The kidneys together weigh 300 g. The substance is pale from cloudy swelling and the appearance of the cortex suggests the presence of catarrh in the tubules. No lesion is found in the bladder. The suprarenals and pancreas are congested and rather soft. The stomach and intestines are œdematous. The mucous membrane of the stomach shows a few small recent erosions along the greater curvature. The small intestine contains a small amount of slimy, bile-stained material, but it is not congested, and there is no change in the lymph follicles. There is slight patchy congestion in the large intestine.

"The pia-arachnoid covering the cerebral hemispheres is opaque and slightly thickened and the underlying convolutions are slightly atrophied; otherwise no lesion is found in the brain or its membranes. The femur marrow is almost entirely fatty, but there is a small area of pale, very soft, red marrow.

"The changes in the lung are those of a pneumonia of unusual type and do not resemble those found in lobar pneumonia, in ordinary broncho-pneumonia, or in septic pneumonia complicating a septicæmia due to infection by any of the pyogenic organisms. The condition of the spleen, however, suggests that a septicæmia is present. There is no lesion to suggest typhoid fever or other acute enteric infection. In view of the changes found in the body I am of opinion: (1) that death was caused by pneumonia and septicæmia; (2) that the appearances are compatible with the clinical diagnosis of psittacosis."

A preliminary histological examination of the sections of the lung by Prof. Wilson shows that the affected areas are uniformly consolidated; the exudate is fibrinous, and that cells are relatively scanty and almost entirely mononuclear. There are scattered areas of congestion and hæmorrhage, and here and there small patches of œdema without fibrin. There is no selective perivascular or peribronchial distribution of the exudate, as occurs often in influenzal pneumonia. The smaller bronchi are filled with desquamated epithelium; the larger bronchi show a similar desquamation but are quite empty. A certain amount of anthracosis is present in the lung with a slight lymphatic reaction. A more detailed account of the histology is in course of preparation and will be included in a subsequent report.

An exhaustive bacteriological investigation of this case has been undertaken by Prof. C. J. Lewis and Dr. W. T. Hillier. A bacillus, in its sugar reactions resembling *B. fæcalis alkaligenes*, has been recovered from the lungs and spleen (both from cultures made at the post-mortem examination and from stab cultures made three hours after death). Prof. Lewis has also isolated from the lung another type of non-lactose fermenting bacillus, which he thinks may prove to be pathogenic. A complete report will be prepared as soon as possible.

CASE 17.—A man of 25, the son of Cases 15 and 16, was admitted to the General Hospital on Jan. 20th. He became ill on Jan. 16th with headache and diffuse pains about the body, but did not go to bed. There was no vomiting or diarrhœa. On admission his temperature was 105°, the pulse-rate 110, and the respiration-rate 25 per minute. He was torpid and slightly cyanosed and there were signs of consolidation of the right base, with marked tubular breath sounds. Two days later the affected lung was quite silent over the whole of its posterior aspect. Exploration yielded no fluid. On Jan. 24th a few fine crepitations were heard at the right base, but breath sounds were almost entirely absent; at the left base a large area of consolidation, with tubular breath sounds, was present posteriorly. Despite the extension of the pulmonary signs, the respiration-rate was only 24 per minute, and there was practically no cough or expectoration. His general condition has improved and his temperature has fallen by lysis to 101°. A blood-count showed a moderate leucocytosis (9800 white cells per c.mm. with 87 per cent. polymorphonuclear leucocytes). Cultures from the blood, urine, and fæces show nothing of importance. From the lung puncture a bacillus has been obtained similar to that isolated from the spleen and lung of Case 16. His serum does not agglutinate salmonella (Mutton) or *B. psittacosis* (Perry), but does agglutinate the organism recovered from the spleen of Case 16 at a dilution 1 : 40.

Four Additional Cases.

CASE 18.—That the clinical picture may be distinctive is shown by the fact that one of the nurses in charge of Cases 13 and 14 told me that she was sure that she had had a similar case some months previously, though at the time it had been regarded as typhoid. Dr. H. C. Rook, of Worcester, in reply to my inquiry, was good enough to send me the following account of the patient to whom the nurse referred :—

There is no doubt that the case brought to your notice was psittacosis. A lady, aged about 35, previously the subject of a hemithyroidectomy for Graves', bought a green Amazon parrot while on holiday at Exmouth toward the end of August, 1929. It immediately moped and was attended by her day and night until its death on Sept. 2nd.

I saw her on Sept. 4th (T. 101°, P. 90) with a history of two days' malaise. On the 8th (T. 102°, P. 100) there was a left-sided rub, and on the 9th, when I saw her with Dr. M. Campbell, of Droitwich, a small left effusion. A tentative diagnosis of typhoid was made, and with this a London consultant who saw her on the 10th agreed (T. 104·8°, P. 110). There was no rash and no enlargement of spleen. Blood count (10th): red 4,600,000, white 6300, and agglutination para. B. The bacteriologist said that he had never seen clumping occur so rapidly—dilution not stated. The temperature remained 104°–105° for a week and was not materially altered by cold baths, the first drop occurring 48 hours after a fixation abscess had been injected. During this time the patient was semi-conscious, with continuous delirium, pain in the neck muscles with head retraction, constipation, frequency and a highly acid urine with bacilli present in quantity. The abdomen was slightly tumid with tenderness over the descending colon, no splenic tenderness, and no rash. The pleuritic effusion, a thin layer, covered a large area; cough was constant with slightly blood-stained sputum. The pulse always remained lower than corresponded with the temperature in spite of the old-standing Graves's disease. Normally her pulse is 100–110. The tongue was brown and dry with sordes. The heart condition gave rise at times to considerable anxiety. The temperature fell by lysis with a corresponding amelioration of symptoms, and by Oct. 3rd the patient was well on the way to recovery.

CASES 19, 20, 21.—Dr. Coutts, of Dudley Port, has kindly provided me with the following account of three cases occurring in his practice.

In April, 1928, a parrot, obtained from a dealer, developed sickness and diarrhœa the day after its arrival in the house of one of his patients and died a few days later. In the house lived two adults and three boys then aged 11, 9, and 7, all of whom were perfectly well. Within a few days of the death of the parrot the eldest boy was seized with vomiting, diarrhœa, and abdominal pain. Profuse and repeated epistaxis occurred. The vomiting and diarrhœa lasted for a fortnight, and he also had signs of bronchitis and patchy broncho-pneumonia. His temperature was moderately raised. The total duration of illness was about eight weeks, and his condition for most of that time was serious. His subsequent health has not been good, as he is still liable to occasional attacks of abdominal pain. The two younger boys both had a similar illness, but milder in degree; the youngest was the least affected. They were taken ill within a week of the onset of the illness of the eldest. All the boys had handled the parrot, but the eldest had petted it most. Neither of the adults was affected.

Review of the Clinical Aspect.

With the four cases described in my first communication,[1] those now reported make a total of 21, of which five proved fatal.

It is fairly accurate to say of the severer cases that they resemble typhoid septicæmia in retaining a relatively slow pulse, despite a high continuous fever. Even before the development of the unusual pulmonary signs, however, certain features distinguish them from true typhoid; the onset is usually more sudden and the temperature rises more rapidly. Headache is intense, generally occipital, and often associated with slight cervical rigidity. Epistaxis occurred in one patient. Sweating was sometimes severe. Diarrhœa and vomiting sometimes occur in the early stages, but as a whole the alimentary symptoms, apart from distension, have been trivial, except in the case of the three children (Cases 19–21). The spleen became palpable in one case, and then only for a few hours; no rose spots have been observed. In one case a typhoid-like relapse occurred. The outstanding feature of the clinical picture is the involvement of the lungs. At the onset signs of slight shifting bronchitis appear, to be followed in a few days by those of extensive consolidation manifested by impairment of the percussion note and the presence of tubular breath sounds. Still later the percussion note becomes completely flat, and breath sounds in the affected area disappear. This curious silence of the lung may persist for some days after the temperature has fallen and the general condition has improved. A whole lung may be affected in this way. Resolution occurs very rapidly and completely, and is accompanied by fine crepitant râles. Repeated explorations of the chest had shown that these signs were in no way due to pleural effusion, and I concluded that they were associated with obstruction of the smaller bronchi. Confirmation of this opinion was afforded by the post-mortem of Case 16.

Certain negative features in the respiratory condition are important. Although cough is frequent and at times incessant, it is never painful, and expectoration is scanty and frequently absent; only twice was any rusty sputum obtained (Cases 5 and 18). Respiration is not hurried unless the area of lung involved is very extensive; it was easy and never "pneumonic" in character. Pleuritic friction was found only once.

The nervous signs described in Cases 8 and 9 are noteworthy, particularly as they were also marked in Case 12 and to a lesser degree in Cases 15 and 17.

Although the clinical course of most of the cases forms a fairly characteristic picture, it is clear from a review of the whole of them that the symptoms and signs may be but slight and equivocal—even when the disease proves fatal (Case 10)—and a diagnosis would be frankly impossible unless the history of contact with sick birds were elicited.

Ætiology of the Condition.

In our earlier investigations a review of such literature as was available led us to concentrate our attention on the discovery of an organism of the typhoid or salmonella type. In the first case, a bacillus corresponding fairly well with this group was recovered from a local parotid swelling, but it must be admitted that the identity of this organism was not completely established, as the importance of the matter was not then realised. Despite the exhaustive search that has been made in some subsequent cases neither *B. psittacosis* nor any similar organism has been recovered, either from a human patient or from a sick bird. This negative result, in agreement as it is with the work carried out at the London Hospital, favours the view put forward recently by Bedson and Western and Levy Simpson, that the disease may be due to a filtrable virus, and it cannot be denied that their recent communications[4] afford considerable experimental support for their suggestion. Prof. C. J. Lewis, however, has recently isolated from the cage of the parrots responsible for the infection of Cases 15, 16, and 17 an organism definitely identical with *B. psittacosis* and salmonella (Mutton). Experimental work with this organism is still in progress, but it has alre[illegible] been [illegible] that subcutaneous inoculation is [illegible] rs to a guinea-pig, and that a [illegible] injection has been followed by [illegible] within two days. This work of [illegible] dvisable, at the present stage, [illegible] as the [illegible] agent of infection, and certain other considerations in this connexion are important. In the first place, the clinical picture of the disease is extremely suggestive in many cases of a typhoid infection, and the incubation period, where it can satisfactorily be determined, is that of the typhoid group. Again, although too much reliance cannot be placed on these reactions, there is the definite fact that three cases gave a positive agglutination with organisms of the typhoid group (two to para. B., Cases 1 and 18, and one to *B. typhosus*, Case 5), and several others have given similar results with *B. psittacosis*—in three instances (Cases 8, 9, and 10) in high dilution. The post-mortem appearance of the lung (Case 16) is also suggestive of an infection by a non-pyogenic organism, and it will be interesting to see if a similar condition in animals or birds can be produced experimentally with the strain of *B. psittacosis* isolated by Prof. Lewis.

Finally, although the negative bacteriological results cannot be neglected, it must be remembered, as Tidy[6] has pointed out, that in epidemic human infection with the salmonella group the causal organism may only be recovered in a very small proportion of cases. For these reasons, therefore, I feel that the precise ætiology of psittacosis is not yet established, and that suggestive as is the work of Bedson and Western and Levy Simpson, it is still uncertain that the disease is entirely a virus infection.

An interesting point in our investigations has been the recovery of an organism resembling *B. fæcalis alkaligenes* from the lungs of Cases 8, 16, and 17. A similar organism was found independently in two laboratories in the heart blood, trachea, crop and bone-marrow of the love bird responsible for the infection of Cases 9 and 10, and also in the fæces of its mate. Feeding experiments with this organism did not give any evidence of toxicity with love birds proved to be free of it, but it may have some importance in association with *B. psittacosis* as a secondary invader.

Conclusion.

A critical survey of these cases leads almost inevitably to the conclusion that serious illness in man may be due to contact with sick parrots or love-birds. The history of Case 12 suggests that apparently healthy birds may also occasionally be responsible for human infection.

The exact means by which the disease is transmitted to man still remains obscure, and I have anxiously considered the possibility that the association with sick birds in these cases was nothing more than a strange coincidence. That facile explanation must, I think, be rejected for the following reasons: (1) The association of sick parrots with unusual forms of human illness was recognised 40 years ago, and a considerable number of cases of this type have since been reported at varying intervals from different parts of the world, though strangely enough very little attention has been given to the matter in this country. (2) The clinical course of the cases described conforms with none of the ordinary types of pneumonia, or typhoid, or infection with the salmonella group. (3) The post-mortem findings in Case 16 are suggestive of an unusual form of septicæmia with lung involvement of a distinctive character, which Prof. Haswell Wilson had not previously encountered. (4) The number of cases that have come to my notice seems to be too large to permit the hypothesis of coincidence and, as I have already said, since the publication of my first paper on this subject[1] a considerable number of histories of illness have been sent to me which warrant the opinion that they were in fact instances of this type of disease. Of these I have included five in this series.

In view of the predominance of the parrot as the agent of infection, the retention of the name "psittacosis" for this group of cases is justifiable at the present time, but is it correct to assume that it is a specific disease due to a particular micro-organism? The clinical similarity of the cases and the singular post-mortem findings suggest that it well may be, but certain considerations render a complete acceptance of that position impossible. Perry's investigation[4] showed that parrots might be heavily infected with an organism indistinguishable from salmonella (Mutton). It is this organism which is preserved in the National Collection of Type Cultures as *B. psittacosis.* So far as I am aware, no case of human infection followed contact with his birds, but obviously it was possible, and had it occurred the symptomatology might have been quite different from that recorded in my cases in which salmonella (Mutton) has not been found. There is, further, the result of the examination of the second parrot associated with Cases 13 and 14; in this instance the bird died of a streptococcal septicæmia, and human infection from it is a possibility which cannot be denied.

Finally, is psittacosis as rare a disease in this country as the scanty references in the literature suggest? The fact that cases have come to my notice at fairly regular intervals since my attention was first directed to the matter, and that Case 11 occurred in 1926, and Cases 19, 20, and 21 in 1928, strongly support the view that similar types of infection have prevailed in England, and that they have not been hitherto recognised.

References.

1. Thomson, A. P.: THE LANCET, 1929, ii., 115.
2. McCrae, T.: Modern Medicine, Osler and McCrae, 1925, i., 128.
3. McClintock, A.: Publication No. 1 of McClintock Foundation, New York, 1925, Pleomorphism in Bacterial Protoplasm: A Study in Psittacosis.
4. Perry, H. M.: Brit. Jour. Exper. Path., 1920, i., 131.
5. Bedson, S. P., Western, G. T., Levy, S. Simpson: THE LANCET, Feb. 1st, p. 235, and Feb. 15th, p. 345.
6. Tidy, H. L.: THE LANCET, Feb. 1st, p. 238.

DISABILITY FOLLOWING CERTAIN FRACTURES.[1]

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THE frequency of disability following fractures and the difficulties surrounding its treatment are too well known to require emphasis. Suffice it to say that no medical or surgical condition attracts more public notice, or figures more largely in the Press. It is frequently the cause of legal actions, the consequences of which may be disastrous to the medical men concerned.

From the practitioner's point of view the important problem is not the treatment of disability, but its prevention. This may be difficult or easy, but disability is very rarely inevitable. I propose to limit myself to fractures of the shoulder, the elbow, and the ankle, as these are particularly likely to be followed by disability. Colles's fracture is not included, for it forms the subject of a special study I am now engaged upon and the results of which I hope to publish in the near future.

Disabilities Following Fractures of the Shoulder.

Most cases of disability after fracture of the shoulder region are attributed either to adhesions or to osteo-arthritis. Injuries to the circumflex nerve, the brachial plexus, and the axillary vessels occur, but are comparatively infrequent.

Adhesions are exceedingly common and are responsible for much disability. Fractures of the shoulder are frequently treated with the arm bandaged to the side, a pad in the axilla, and the forearm supported in a sling across the chest, this fixation being maintained for two or three weeks before movements are begun. With such treatment, adhesions are almost bound to develop, particularly in or around the lower and front parts of the joint. These adhesions produce painful limitation of movement and interfere grossly with the function and usefulness of the joint. The movements mostly limited are abduction, external rotation, and, to a lesser degree, hyperextension of the arm. In fractures of the anatomical neck of the humerus or of the glenoid cavity of the scapula, the adhesions tend to be mainly intra-articular, and result from the organisation of blood clot in the joint or from the healing of tears in the synovial membrane or capsule. Both these fractures run into the shoulder-joint and the adhesions may be looked upon as natural consequences of the traumatic arthritis which ensues. The adhesions which follow fractures of the surgical neck of the humerus are mainly extra-articular, and result from the healing of tears of the capsular ligaments or of the muscles and tendons closely grouped around the joint. To enable the movement of abduction to occur, the lower part of the capsule of the joint is attached to the surgical instead of to the anatomical neck, thus securing for itself a certain necessary degree of looseness. In fracture through the surgical neck—which, by the way, is much the commonest fracture of the shoulder region—the lower part of the capsule is frequently torn. Unless special precautions are taken, the healing of this tear will be followed by contraction or adhesions in the lower part of the capsule, with the result that the movement of abduction becomes seriously limited. Abduction, which is the most necessary movement of the shoulder, is unfortunately also the weakest. It is lost with surprising ease, mainly owing to the development of adhesions, but also because it opposes gravity and is itself opposed by very powerful adductor muscles.

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[1] Delivered before the Ilford Medical Society on Dec. 10th, 1929.

There should never be any difficulty in diagnosing adhesions following fractures of the shoulder. There is progressive limitation of movement in certain directions only, other movements remaining free. Attempts to obtain movement beyond what is permitted by the adhesions cause severe pain. The patient is unable to raise or turn his arm without pain, and soon loses confidence in, and becomes afraid of, using the joint. The organic disability thus becomes aggravated by functional weakness, and the latter may persist even when ful movement has been restored by treatment.

In all cases absorption of hæmorrhagic exudate should be hastened by early massage, perhaps coupled with radiant heat. When the fracture is incomplete or soundly impacted, as is often the case with the anatomical neck, adhesions can be completely prevented by early mobilisation. Gentle, supported passive movements are commenced on the third or fourth day and are gradually increased until by the end of the week the arm is abducted to a right angle. The movements should be performed by the practitioner himself, and to ensure that the abduction is not the result of rotation of the scapula, this should be controlled by an assistant. In these cases the only support which is necessary is an efficiently applied sling, which is removed once or twice daily for the exercises.

When the fracture is complete, early mobilisation is unfortunately impracticable owing to the danger of causing redisplacement. It is always possible, however, to reduce the adhesions—and the disability occasioned by them—to a negligible minimum, by supporting the shoulder in abduction during the fixation stage (three weeks). For this purpose either a skeleton abduction splint or a plaster-of-Paris spica may be used. Incidentally, this position usually secures far better alignment of the fragments than can be obtained with the arm at the side. In this position of abduction, effective adhesions can only form in and around the upper part of the joint, and these will be readily stretched by the weight of the arm when the limb is brought down again.

At an early stage the adhesions can be stretched and the lost movements regained by systematic exercises, but the process tends to be long and tedious and, unless due care is taken, there is danger of fracturing the young callus and of causing repeated trauma which may terminate in osteo-arthritis. When a reasonable trial of exercises fails to restore mobility, the adhesions must be broken down by manipulation under anæsthesia, sufficient time (10 to 12 weeks) having first been allowed for the consolidation of the fracture.

Osteo-arthritis is a common complication of fractures of the shoulder in middle-aged and elderly people, and is especially likely to follow fractures of the anatomical neck of the humerus. Its development is a sequel to trauma of the joint, particularly when there is unreduced displacement of the articular surfaces and rough ends project into the joint cavity. Osteo-arthritis of the shoulder causes much pain and stiffness, both of which are aggravated after rest. Abduction is again the movement mostly limited. Creaking can be felt over the joint on movement, and there is usually a characteristic X ray picture.

Absolute reduction of displacement and restoration of smooth intra-articular surfaces is the ideal prophylactic measure, but unfortunately this is not always practicable. Much can be done to alleviate the symptoms by physical measures, such as avoidance of strain, massage and careful exercises, diathermy and radiant heat. Foci of infection must be looked for and treated. Very often, however, these measures fail to give adequate relief, and we have to resort to excision of the head of the humerus to overcome the disability. The results of this operation are usually quite satisfactory.

Disability Following Fractures of the Elbow.

In this group are included fractures of the lower end of the humerus, the upper end of the radius, and the coronoid process of the ulna. Disability after these fractures is mostly produced by the following complications: stiffness of the elbow, ischæmic contraction, injury to the ulnar nerve, and myositis ossificans. Malunion, with alteration of the carrying angle, is another cause of disability, but can be easily avoided by securing accurate reduction of the fracture.

Stiffness of the Elbow.—Disability from a stiff elbow is a very frequent result of fractures of this region. The limitation of movement may be produced by adhesions or by excessive callus formation and can usually be attributed to faulty after-treatment. Modern teaching rightly insists that these fractures after any displacement is reduced should be put up with the elbow in full supination and in as much flexion as is consistent with a free circulation. There is much difference of opinion, however, on the subsequent treatment. The usual procedure is to remove the sling or retentive bandage once daily, after the fourth or fifth day, for massage and active extension of the elbow to the limit of painlessness. The range of movement is increased daily, full extension being aimed at by the end of the third week. Theoretically this method of treatment should be above criticism, but its practical results are often most unsatisfactory. The elbow is an exceptional joint in that early mobilisation, instead of preventing stiffness, actually seems to predispose to it. I think the explanation is to be found in the marked and well-known tendency for excessive callus to be formed in this region. Early movement naturally throws a strain on the young callus and leads to further overgrowth of it. The eventual result is a progressive limitation of movement, especially of flexion, although for the first few weeks a good range of movement may be obtained. Further damage is often inflicted by the misguided zeal of energetic masseuses who, in the erroneous hope of dispersing adhesions, actually produce them by the so-called petrissage or deep kneading variety of massage. This traumatises the young fibrocellular tissues thrown out in the process of repair, and thus leads to fibrosis and scarring in and around the joint.

Confronted by a progressively stiffening elbow, which seems to become worse the longer massage and exercises are continued, the practitioner often falls into the error of trying to mobilise the joint by forcible manipulation under an anæsthetic. This may improve matters for the moment, but the elbow is curiously intolerant of such treatment, and the ultimate result is more callus, more adhesions, and worse stiffness. Occasionally even absolute ankylosis may follow.

This unfortunate experience is leading to the recognition that fractures of the elbow should be treated by a prolonged period of complete immobilisation in flexion and supination. This may be carried out by loops of adhesive plaster or by a "figure of eight" plaster-of-Paris bandage. Three weeks is the period recommended by many orthopædic surgeons, but in my opinion four weeks would not be too long. The elbow, of course, is the only joint immobilised, the shoulder, wrist, and hand being moved from the first. Massage should be avoided absolutely. At the end of the four weeks the retentive appliance is removed, the arm supported by a sling, and gentle active movements commenced. After another fortnight the patient is encouraged to use the limb and the sling is discarded. The elbow will be rather stiff at first, but the movement which will be limited is extension, and it is surprising how easily this stiffness is worked off with functional use, especially in children, who form a large percentage of the patients. My experience has convinced me beyond any doubt that prolonged immobilisation followed by functional use is the correct treatment for these fractures. Its adoption, however, requires a little courage, for the surgeon will have to resist not only his own instinct, which will urge him to employ the measures he has found effective in other fractures, but also the demands of the patient, and especially of the parents, who may not unnaturally consider the treatment old-fashioned and its immediate results disappointing. The ultimate result, however, will more than justify these measures.

Ischæmic contraction is one of the worst disasters that can result from faulty treatment. It is a common complication of fractures of the elbow only, and is caused by tight splinting or bandaging. Nowadays, the cases usually follow fixation of the elbow in acute flexion, without allowance for the post-traumatic œdema which follows the fracture. Children are more liable than adults, because their complaints of pain or tightness are apt to be ignored and also because their arteries are more compressible. The first symptom of the condition is pain, which is complained of within a few hours of the constriction. This is rapidly followed by swelling, coldness, and blueness of the hand. Within 24 hours the characteristic deformity, known as Volkmann's contracture, has made its appearance. The elbow is flexed, the wrist flexed and pronated, and the fingers clawed into the palm. On removal of the splints or bandage the muscles of the front of the forearm are felt to be hard and doughy, while active movements are markedly diminished and it is impossible to extend the fingers and wrist. Occasionally there is a glove-like anæsthesia of the hand and fingers. Pathologically the condition is an ischæmic myositis, and results when the muscles have been subjected to a partial but prolonged deprivation of their blood-supply The affected muscles first become œdematous and, unless the constriction is rapidly removed, they undergo a kind of coagulation-neurosis and very soon become doughy, shortened, and paralysed. An interstitial fibrosis follows and matts the muscle-bellies into a firm inextensible mass. The resulting disability is often absolutely crippling, and in neglected cases the ultimate outlook is extremely bad.

Ischæmic myositis is a condition which need never occur if reasonable precautions are taken. When splints are used they should be well padded, while bandaging should never be tight. Ample allowance must be made for post-traumatic œdema and, above all, fractures of the elbow should never be put up in acute flexion before the œdema has subsided. A comfortable degree of flexion (130° to 140°) is all that is necessary at first. A careful watch should be kept on the pulse, and at the first complaint of pain or constriction or the first sign of swelling, coldness, or blueness of the hand the splints or bandage must be removed and the limb massaged and moved.

Once the contracture is established, chief reliance must be placed on passive stretching of the contracted structures. The distal joints are straightened first, starting with the fingers, the proximal joints being flexed to relax the shortened muscles. The ground gained is preserved by splinting, further splints being superimposed as more proximal joints are extended until all tendency to contraction has been overcome. If these measures fail, some benefit may be expected from operation, but the ultimate results are usually poor, as the fibrosed muscles can never recover normal function.

Myositis Ossificans.—The traumatic variety of myositis ossificans is an uncommon but important cause of disability after fractures of the elbow. The fractures are usually incomplete, the periosteum being torn and bone cells escaping into the muscle-tissues. As a result masses of true bone form, mostly in the substance of the brachialis anticus, and cause considerable pain and weakness, besides interfering to a degree with the movements of the joint. These masses can be easily recognised in a radiogram. If the cases were left alone the condition would soon subside and the ultimate disability would be nil. But unfortunately the lesion is often aggravated by injudicious physical therapy, especially by deep massage and forcible movements. The result of such treatment is to provoke a reaction of the osteogenetic tissues and a further escape of bone cells, until quite large masses of bone may be formed, with progressive disability as the ultimate outcome. This, then, is another argument in favour of prolonged immobilisation and against the use of massage and early movements in fractures of the elbow.

Injuries of the Ulnar Nerve.—The ulnar nerve is mostly injured in fractures involving the internal condyle of the humerus. In the great majority of cases the nerve injury is actually coincident with the fracture and is caused by the original violence and not by the fracture itself. This applies not only to the ulnar nerve but also to all nerve injuries complicating fractures. Secondary involvement of a nerve by a perineural fibrosis or by the friction effect of callus does occasionally occur, but is very much less common. The belief that nerve injury is produced by a nerve being caught in and compressed by callus is absolutely erroneous, although it may be comforting to the practitioner who has overlooked a nerve lesion existing from the first, and who only discovers it when the splints have been removed and functional use of the limb resumed. Safety can only lie in strict observance of the rule that all cases of fracture should be investigated for a possible nerve injury at the very first.

Disability Following Fractures of the Ankle.

No fractures are responsible for more disability than those of the ankle. Bad results are, in fact, so common that a feeling exists among many practitioners that a degree of disability is inevitable after these fractures. This, in my opinion, is quite an unjustifiable attitude to adopt. Admittedly, the treatment of fractured ankle is characterised by peculiar difficulties, but it is perhaps not adequately realised that all these difficulties can be overcome, and that it is possible to obtain very satisfactory results in the vast majority, if not in all cases, provided certain essential principles of treatment are scrupulously observed. Nearly all cases of disability can be attributed to one of three complications: gross malunion, traumatic flat-foot, and osteo-arthritis. It can be stated quite emphatically that all these causes of disability are directly or indirectly caused by errors of treatment, and therefore that they can all be prevented.

Gross malunion occurs after fractures with marked displacement, which have either been neglected or treated very inefficiently; these cases are becoming much less common. Many patients with gross deformity after a fractured ankle retain remarkably good mobility of the ankle and tarsal joints, others develop a stiff and painful ankle, but they all complain of weakness and instability and find walking difficult. To prevent malunion it is necessary to secure absolute reduction of every element of displacement at the first. Fractures of the ankle vary considerably in their ætiology and in the resulting displacement. In the great majority of cases the essential injury is a fracture of the lower end of the fibula caused by violent abduction or external torsion of the foot. The fracture may be transverse and occur a little above the external malleolus, but more often it is oblique and runs through the malleolus itself and into the joint. In some of these cases the fracture of the fibula is uncomplicated, the tibia and ligaments remaining intact, without any displacement. More frequently, however, the internal lateral ligament is ruptured or the internal malleolus is avulsed by a more severe degree of violence. In these cases the lower end of the fibula, with the foot, are displaced outwards into a valgus position, and there is frequently some overlapping of the fragments, with shortening of the fibula. Occasionally there is marked backward displacement of the foot in addition, but this is generally caused by an associated fracture of the posterior margin of the lower end of the tibia.

No matter how severe the displacement, accurate reduction can nearly always be obtained by manipulation under an anæsthetic. The essential steps in the technique are as follows:—

The knee is first flexed to relax the tendo Achillis. The surgeon then grasps the foot with one hand and the leg with the other, and very deliberately corrects every element of displacement. *In the usual case of fracture with outward* displacement the foot should be forcibly pulled down, and then twisted inwards until the astragalus is brought completely under the lower end of the tibia. Definite contact must be made between the astragalus and the internal malleolus. In this manner the outward displacement is corrected and the fibula realigned and restored in length. It is this realignment of the fibula which is the essential step in the reduction of the fracture. In addition, any backward displacement must be corrected by pulling the heel forwards until full dorsiflexion of the ankle is obtained.

The crucial part of the treatment lies in the fixation of the limb in a retentive apparatus, without allowing redisplacement to occur. Actually the danger of this is exaggerated, but undoubtedly the safest thing to do is to apply a three-piece sectional plaster case, which completely overcomes the risk of redisplacement. First the foot and then the leg are encased in plaster bandages, a two- or three-inch interval being left at the fracture site. When the leg and foot pieces have hardened, the third piece of plaster is applied by an assistant, while the surgeon holds the foot in full inversion and slight dorsiflexion. Great care must be taken to prevent circulatory embarrassment by adequate padding, and it may be necessary to remove the first plaster after the œdema has subsided and apply a fresh and closer-fitting case. In three weeks the plaster is removed, a light bivalved case is applied, and movements started. Excellent reduction can be obtained by the above technique, even in fractures with gross displacement. Six months after the fracture the functions of this patient's ankle and foot were absolutely normal.

Traumatic flat-foot is an exceedingly common result of fractures of the ankle. Although predisposed to by shortening of the fibula, the main cause is premature and unguarded weight-bearing, which has the effect of causing the young callus to yield and so leads to progressive valgoid displacement of the foot. This variety of flat-foot is curiously painful and rigid, and causes very severe disability. At first the rigidity is produced by muscle-spasm, but it becomes fixed later by the formation of adhesions.

Fortunately, the prevention of traumatic flat-foot is a simple matter; the essential point is to prohibit any weight-bearing until the end of the second month. For the first six months after this protection should be afforded by wedging up the inner border of the shoe by one-third to half an inch, while in heavy people an outside iron with inside T-strap is recommended in addition. Either boots or strong shoes should be worn for the first few months. When flat-foot is an accomplished fact it is best treated by thorough mobilisation under an anæsthetic, the object being to break down adhesions and restore the arches of the foot. For a few weeks the correction should be maintained by encasing the foot in a bivalved plaster in full inversion. After this the patient is allowed up with a thickened inner border of the shoe and a long arch support, mobility of the joints being preserved by massage and exercises.

Osteo-arthritis can be attributed to incomplete reduction of displacement. The joint-line is broken and rough ends project into and irritate the joint, and osteo-arthritis is the result. The older the patient the greater is the likelihood of osteo-arthritis. The ankle becomes swollen, stiff, and very painful, the patient being severely disabled.

The prevention of osteo-arthritis depends entirely on securing absolute reduction of displacement, which must in all cases be immediately confirmed by X rays. If the radiogram shows any residual displacement, it is wiser to obtain exact anatomical reduction by open operation than to leave things to nature.

Clinical and Laboratory Notes.

A CASE OF ANEURYSM OF THE HEART.

By W. S. Russell Thomas, M.B. Camb.

The following case presents some interesting features.

A fairly stout man, aged 58, died suddenly after defæcation. He had not consulted a doctor for years, and, according to his wife, the only complaint she had heard him make about his health was of some shortness of breath and occasional pain over his heart.

Post-mortem examination revealed a distended pericardium, containing a very large quantity of blood. The heart was removed very carefully. It was larger than normal, and there was a good deal of fatty infiltration, but the most striking feature was an obviously thin-walled sacculation, bigger than the half of a walnut shell, on the anterolateral side of the left ventricle. On the superior part of this sacculation was a ragged hole through which a pencil could be passed.

The mitral and aortic valves were slightly thickened and the left ventricle dilated, with walls somewhat thickened at the base, but rapidly thinning towards the apex. The thickness of the walls above the sacculation was about one-eighth of an inch; at the sacculation only the thickness *of the membranes of a fœtus*, and nearer the apex they became slightly thicker, but not more than one-eighth of an inch. The myocardium showed definite signs of fatty degeneration, and the aorta some patches of atheroma; otherwise there was nothing abnormal.

The other organs were in fair condition except for one stone in the gall-bladder, and what appeared to be a small quantity of pus in the pelvis of the right kidney; the kidney substance was almost normal.

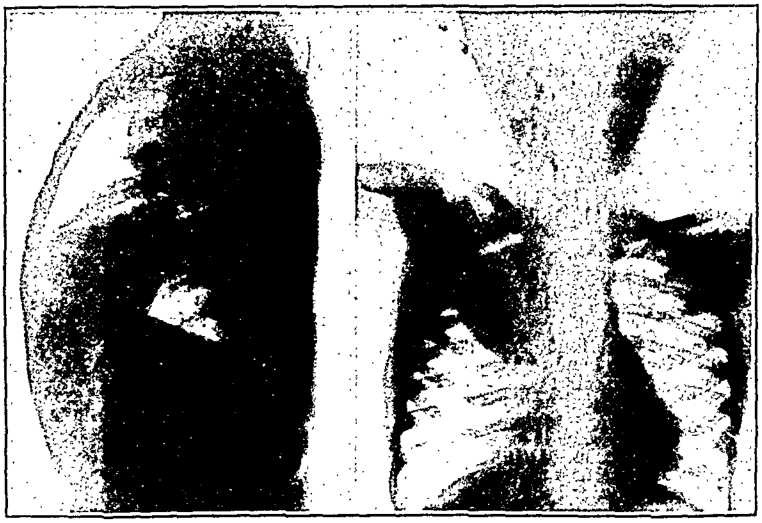
Here, then, was a man with an extremely thin-walled left ventricle—so thin in one part that it formed a very marked sacculation—yet feeling well enough to work. His symptoms were not sufficient to make him want to consult a doctor. One day the sacculation became so thin that it burst after the act of defæcation, and death followed almost immediately.

CASE OF
GANGLIONIC NEUROMA OF THE MEDIASTINUM IN A CHILD AGED NINE.

By W. C. Harvey, M.D. Glasg., D.P.H.,
MEDICAL SUPERINTENDENT, DUMFRIES AND GALLOWAY SANATORIUM, LOCHMABEN.

The following are some notes on a rather unusual and interesting case which was recently admitted to the Dumfries and Galloway Sanatorium, Lochmaben, for observation purposes.

A child, aged 9 years, was said to have been quite well until May, 1928, when she developed broncho-pneumonia. After her recovery from this she was left with a p [illegible] ugh which was worse at night, and in addition she suffered from night sweats and an apparently genuine lassitude. At times she became very breathless and cyanosed and was absent from school for prolonged periods. At other times she would be almost free from symptoms. After a period during which she did not improve, the family doctor called in the tuberculosis officer for Kircudbrightshire, in which county the child resided. Tuberculosis was rightly suspected, and the sputum, which was occasionally copious, was examined. No tubercle bacilli were found, but there was an increase of albumin in the sputum and it was therefore decided to send her to the sanatorium for a period of observation. She was accordingly admitted to Lochmaben on July 7th, 1929.



Lateral and anterior radiograms of the chest, showing position of the tumour. In the films the border of the lung could be traced through it—i.e., the tumour projected beyond the lung on all aspects.

The child was well-nourished and looked quite healthy apart from a rather marked sallowness of the skin. Physical examination of the chest revealed a pronounced dullness over the upper lobe of the right lung and in this area the breath sounds were considerably diminished posteriorly, but were bronchial in nature in front. No adventitious sounds were audible at any time and there was no marked change in vocal resonance. The child's voice was harsher than normal. She was observed over a short period and the temperature was found to be perfectly normal, while the pulse-rate was quite steady. The Pirquet test was mildly positive.

An X ray film of the chest was taken and revealed a most peculiar condition. A large mass, of a circular shape and with a well-defined margin, was seen to be filling up the whole of the upper lobe of the right lung. The mass was contiguous as far as could be seen, with the chest wall dorsally, and was causing a "kinking" of the trachea. It was very difficult to tell from the radiogram whether the mass was extra- or intra-pulmonary in origin, and the film was accordingly sent to Dr. Woodburn Morrison, radiologist, Royal Infirmary, Edinburgh, for his opinion. Dr. Morrison sent back word that he could not make up his mind on the point in question, and suggested that the child should be sent to Edinburgh for further investigation. This was done and a diagnostic pneumothorax was performed. Further radiograms (see Figures) revealed the fact that the mass was extra-pulmonary and quite free from the chest wall. The provisional diagnosis of a cyst, either dermoid or hydatid, was made and permission to operate was obtained, the child then being handed over to Mr. Bruce Dick for operation.

On Oct. 26th Mr. Dick, under local anæsthesia, removed about one inch of the second and third ribs posteriorly, fixed together the visceral and parietal pleura in the neighbourhood and made a preliminary investigation of the mass. Rather to everyone's surprise it was discovered to be a tumour of a lipomatous nature situated outside the lung and completely encapsulated. The wound was then stitched up and the child left for a week. Seven days later the wound was reopened under a general anæsthetic for the removal of the tumour. The removal was not easy, as the tumour was large and had a small pedicle attached to the mediastinum. Eventually, however, it was removed successfully after being freed from its capsule. The child ran a temperature for a few days, but after that she made an uninterrupted recovery and within three weeks of the operation was up and about and ready to go home. Further radiograms have shown that the lung has fully re-expanded. A certain harshness of the voice which was present before the operation disappeared.

The sections of the tumour showed that it was composed of ganglionic nerve-cells and non-myelated nerve-fibres. The stroma consisted mainly of fatty tissue.

As there are very few cases of mediastinal tumours of this nature on record, this one appears to have some interest. A feature of the case was the difficulty in diagnosis since the symptoms and, to a certain extent, the signs simulated hilar tuberculosis rather closely. Indeed, even when tuberculosis had been excluded, the diagnosis was not finally cleared up until exploratory thoracotomy was performed.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 8TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 374 (last week 354); scarlet fever, 2727; diphtheria, 1975; enteric fever, 34; pneumonia, 1332; puerperal fever, 45; puerperal pyrexia, 111; cerebro-spinal fever, 9; acute poliomyelitis, 12; encephalitis lethargica, 20; dysentery, 12; ophthalmia neonatorum, 87. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Feb. 11th–12th was as follows:—Small-pox, 571 under treatment, 26 under observation (last week 558 and 28 respectively); scarlet fever, 2310; diphtheria, 2786; enteric fever, 16; measles, 1003; whooping-cough, 95; puerperal fever, 22 (plus 13 babies); encephalitis lethargica, 120; other diseases, 15. At St. Margaret's Hospital there were 12 babies (plus 3 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox or enteric fever, 76 (32) from measles, 12 (2) from scarlet fever, 31 (6) from whooping-cough, 61 (12) from diphtheria, 60 (18) from diarrhœa and enteritis under two years, and 89 (18) from influenza. The figures in parentheses are those for London itself.

Fatal cases of measles were concentrated at Manchester 10, Portsmouth 9, West Ham 8. Deaths from whooping-cough were much more widely distributed, with a maximum of 4 at Bradford. Diphtheria claimed 7 victims at Liverpool and 4 at Cardiff. No great town recorded more than 3 deaths from influenza.

The number of stillbirths notified during the week was 302 (corresponding to a rate of 45 per 1000 births), including 50 in London.

COUNTY NURSING ASSOCIATIONS.—At a meeting of the Committee of the County Nursing Associations last week those bodies were recommended to apply to the new Public Assistance Committees for the continuance of the grants hitherto given by boards of guardians for the nursing of necessitous cases. An inquiry is being made into the schemes adopted by hospital leagues to provide hospital treatment for their members with the view of adapting them to the district nursing service in the hope of lessening the pressure on the hospitals.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF THERAPEUTICS AND PHARMACOLOGY.

A MEETING of this Section on Feb. 11th, with Dr. GEORGE GRAHAM in the chair, was devoted to a discussion on the

TREATMENT OF URÆMIA.

Prof. F. G. LANGMEAD, in opening, said that, so far as the physician was concerned, uræmia as met with in Bright's disease was a late symptom of an incurable disease, and for that reason did not provide very hopeful material for a talk on treatment. But various views were held on what ought to be understood by the term uræmia; one school allocated to it a small group of symptoms—chiefly cerebral and gastro-intestinal—whereas another school would include any uræmia which could be attributed to toxæmia, even renal retinitis. The treatment could not be approached scientifically without knowledge of its cause, and at present knowledge could not be said to have got beyond the stage of hypothesis. If uræmia was to be regarded as a toxicosis limited to Bright's disease, it must be inquired whence the toxins were derived, whether from katabolic processes or from the kidneys themselves; whether the ductless glands, such as the adrenals, played a part; and whether the presence of toxins preceded the renal disease and explained its production. It was possible that several factors combined to form the picture which received the label uræmia. Here lay a vast field urgently needing exploration, and until it had been explored the treatment must be largely empirical. Really, the proper treatment was to prevent the onset of uræmia, and this meant greater care of the patient in respect of specific infections and the elimination of focal sepsis. The speaker's own usual treatment of uræmia had, he said, no flavour of novelty; it consisted of purgation, diaphoresis, and venesection—the latter being the greatest of the three. There was need for care in purgation and his preference was for jalap, which acted quickly as a cathartic, and was, he thought, preferable to salines. For diaphoresis he had no hesitation in combining hot packs or radiant heat baths with pilocarpine if the patient had no heart trouble or symptoms of respiratory failure. Hot beverages, such as lemonade, enhanced the prospects of profuse sweating, which was of great benefit in these cases. He had seen patients come out of uræmic coma as a result of profuse sweating, but he was aware that the use of both pilocarpine and fluids was open to dispute on theoretical grounds. Another bone of contention was the use of morphia. He gave this drug when there were twitchings and convulsions. In dogs it was found that injection of morphia increased the diuresis if that were already present. On the other side was the possibility of provoking distension of the colon. Some thought lumbar puncture dangerous in the presence of uræmia, but Prof. Langmead had seen benefit from its use, and some physicians *preferred it to other methods*. The diuretics which seemed permissible were the saline group, though perhaps even those were better avoided. Diuretics containing mercury seemed to be distinctly dangerous. Isotonic salines apparently threw an increased burden on the kidney and hypertonic salines had an added disadvantage. The injection of a 5 per cent. glucose solution might prevent some of the disadvantages; Strauss reported increased diuresis with it, but the speaker did not think *Strauss used it in uræmia. He had himself* given it to a patient with a large white kidney and considerable œdema, which had been present some months and had failed to react to the usual treatments, and as a result the patient was much brighter, considerable drowsiness having come on a short time previously. He would like to know whether cupping and the use of hot rectal salines had gone out of use; he did not know how they acted, unless it was by reflex dilatation of the splanchnic vessels.

Uræmia was accompanied by deficiency of calcium in the blood, and this had led to the use of parathyroid and calcium lactate. He asked whether those who had used this had had any effect from *it other than increase of the blood calcium.* Were any tangible effects on record as a result of using alkalis in uræmia? Also had any of his hearers carried out blood-washing—i.e., removing toxins from the blood by dialysis? The method was to remove 500 c.cm. of blood at a time, using heparin to prevent coagulation, dialyse it through a collodion membrane, and then return it to the body, the process being repeated until most of the blood had been so treated. By this means 1·75 g. of urea had been removed, *but the result in the classical case had been* no more than a week's improvement. The chief use of operation in uræmia, on the medical side, was in acute cases with suppression, in which acute congestion and consequent tension in the capsule interfered with function; incision of the capsule then permitted of a freer renal circulation. The opportunities for this operation were rare, but he had known it done with some success in mercurial nephritis. Thyroid extract had been used to promote diuresis, but as it enhanced metabolism he did not think it should be employed in uræmia.

Dr. E. P. POULTON asked why Prof. Langmead gave a 5 per cent. glucose solution as a hypertonic rather than 6 per cent. or 7 per cent. With regard to the use of parathyroid, he said that all last summer he had had under care a man with what would be called large white kidneys. Parathormone was tried in big doses, and the first time it was used it seemed to have some effect in diminishing the œdema and increasing the *flow of urine. Then it was stopped. On a second* trial in the same patient it was not successful. The calcium was slightly raised as a result, but was still low. What produced the most dramatic effect was the ordinary administration of urea. 15 g. thrice daily raised the blood-urea to 40 or 50 mg. and the urine was increased from 500 c.cm. per day to 1500. He had read that if potassium and calcium were given together they produced diuresis in the isolated kidney.

Low Protein Diet.

For uræmia Dr. Poulton thought a low protein diet should be given, and one of two cases recently under his care illustrated its value.

A woman, aged 54, had suffered from headaches for three years. Her feet and arms were swollen, and two days before the note was made she began to vomit; during the previous three weeks she had not passed the usual volume of urine though drinking her accustomed amount. Her blood pressure was 165/120 and her blood-urea 90. She had 16 g. *of fat and 24 g. of carbohydrate,* and *two days later the* blood pressure was 160/110. She was then put on a strict diet with hardly any protein, being fed on vegetables, potatoes, fruit, butter, and copious drinks of dextrose. The blood pressures on the three following days were 140/90, 140/81, and 142/80. The last blood-urea estimation was 53.

Care had to be taken that the amount of albumin lost was made up by the diet. The other case was not successful, but it bore out certain points. Primarily it was one of *Bacillus coli* pyelitis, and in spite of treatment this grew worse, so that the condition was now probably "surgical kidney." When she entered hospital the blood pressure was 230/135, the blood-urea was 280 mg., and she was vomiting. She was put on a fairly high protein diet for a time, and was then started on a new diet, containing almost no protein. Yet the blood-urea increased daily, the figures being 291, 320, 309 (cerebro-spinal fluid), and 394. She was passing 25 parts of albumin per 1000. The volume of urine was 18 oz. a day, and it contained 1 per cent. urea. He wondered where all this increase *came from, seeing* that the diet contained practically none. Did it mean that the body proteins were breaking down in the last attack?

Dr. W. LANGDON BROWN thought the gastro-intestinal disturbance in these cases showed an attempt was being made on the part of the body to get rid of some of the nitrogenous waste. The vomited material contained a large amount of ammonium salts. The skin rashes, too, were an alternative method of excretion; these he had seen in cases with very high blood-urea.

Classification and Treatment.

He personally would include under the term uræmia three groups: (1) those cases with convulsions and amaurosis; (2) those with uræmic asthma; and (3) those with all the other cerebral manifestations which were familiar. The first group he thought were due to some general toxic condition, in which the kidney might not share, because they were encountered in such conditions as eclampsia and in the degenerative toxæmic kidney. Though alarming and dramatic, convulsions were amenable to treatment, and often stopped after venesection, patients sometimes recovering thereafter from the nephritis as well as the uræmia. During the war he had eight cases with uræmic convulsions. None of them died, and scarcely any of them left hospital with any albuminuria. Therefore these cases were not necessarily associated with damage to the kidney. It was agreed that uræmic asthma was associated with acidæmia due to the retention of acid potassium phosphate, and here help was derived from the free administration of alkalis. The third group were associated with a rise of blood-urea. The uræmia was certainly not due to the retention of urea; probably the culprit was some amino-acid. The figures given by Dr Poulton suggested that in the last resort there was a breakdown of nitrogenous protein.

As to treatment, he differed from the opener in that he did not like pilocarpine When he used it earlier in his career, respiratory failure and œdema of the lungs seemed to come on more quickly when pilocarpine was used than without it, and there appeared to be a causal connexion between the two. He thought the newer diuretics, containing arsenic and mercury, were scarcely safe in the treatment of uræmia. In these cases the protein should be cut down at an early stage. Sepsis was a very grave incident in precipitating metabolic disaster. His conclusion was that the only cases suitable for diaphoresis were those in which there was a good deal of œdema. More water was secreted following a hot-air bath than with any other method, and after a few days sweating occurred at a lower temperature than at first. In the absence of œdema he did not favour diaphoresis, because it put too much strain on the heart.

Dr. T. Izod Bennett expressed doubt about uræmic vomiting being a physiological or compensatory mechanism; he preferred to regard it as a toxic manifestation. The factor mainly responsible for deaths from uræmia was the dehydration following excessive vomiting. Therefore he thought life could be saved in many of these cases by stopping the vomiting—e.g., by means of barbituric acid, or even by morphia. In uræmic asthma when there was marked air-hunger, sodium bicarbonate in large doses might bring about a rapid change for the better. He agreed that venesection was valuable in these cases. In many comatose patients magnesium sulphate would restore consciousness. Much depended on the type of renal lesion. In some acute cases the restoration of consciousness started an improvement which ended in restoration to health.

Dr. Otto Leyton agreed that the amount of urea in the blood was not necessarily a measure of the uræmia, so called. Urea had to be in a state of high concentration in the blood before it caused symptoms. Many years ago it was largely the custom to give the lactic acid-forming bacillus, but that was useless unless it was properly prepared. In cases of uræmia with a good deal of œdema he had several times carried out with benefit the method advocated by the late Dr. William Ewart—namely, to sit the patient up so as to encourage the collection of fluid in his legs, and then slice the legs and liberate many pints of fluid, which was found to contain 0·1 per cent. of urea. He had known patients go five months before the fluid collected again.

Dr. A. A. Osman said that a series of patients with chronic parenchymatous nephritis of five years' standing, with considerable œdema but little evidence of nitrogen retention, were given large doses of alkalis, and in each case the œdema satisfactorily cleared up in a few weeks. It was thought that the dose of alkali could be diminished, but when an attempt was made the œdema showed signs of returning. During the period of treatment, however, the blood-urea increased. He had found lumbar puncture very useful in uræmic cases, and he had not seen harmful results. He did not favour decapsulation of the kidney, for diuresis could be increased by other means. He thought a high protein diet had a harmful effect by forming much acid; this could sometimes be counteracted by giving alkalis.

The Chairman thought that venesection was valuable but should be carried out only in the early stage. He had seen late cases in which there was only 30 to 40 per cent. of hæmoglobin, and in them venesection would be very risky. They stood more in need of transfusion, if this was thought worth while. He had seen two patients who, with a high degree of alkali in the blood, were treated surgically for other conditions, and who developed uræmia. Before giving alkalis it was necessary to be certain of the diagnosis, and to have estimates of the alkali reserve and the hydrogen-ion concentration. Vomiting was apt to increase the alkali reserve.

Dr. Arthur Phear held that pilocarpine was dangerous in these conditions, though it seemed useful in promoting sweating if the patient had a stubborn skin which did not sufficiently respond to the hot-air bath. In doses of gr. 1/10 to 1/20 it made all the difference. Lumbar puncture was valuable in a limited number of cases, including those with acute cerebral symptoms.

Sir William Willcox stressed the importance of making sure that the case being dealt with was actually uræmic. Advanced morbus cordis, impaired hepatic function, and arterio-sclerosis with changes in the cerebral vessels, might produce symptoms closely simulating those of uræmia. Prognosis was harder in renal cases than in any others. Vapour baths for uræmia were dangerous unless the heart was in good condition; he had seen a patient die from a vapour bath. Hot-air and electric baths he regarded as much safer. Eliminations by the bowel could be greatly helped by colon washing. Caffeine sodium salicylate was valuable in doses of grs. 2 every four hours in promoting the excretion of the kidney. It was a vexed question whether morphine should be given in renal cases and no definite rule could be laid down. If it was given, gr. 1/8 or 1/10 was ample. For the headaches or uræmia large doses of bromide were helpful.

Prof. Langmead briefly replied.

SECTION OF NEUROLOGY.

At a meeting of this Section held on Feb. 13th, at which Dr. Gordon Holmes, the President, took the chair, a discussion on the

Relation of Nervous Symptoms to Nervous Lesions

was opened by Dr. S. A. Kinnier Wilson. As a beginner in the study of nervous diseases, he said, it had seemed to him practical to separate cases in accordance with their particular semiology. A given disease was represented clinically by a corresponding syndrome, and even if the generic picture was specifically modified it could be relied on for purposes of diagnosis. He had soon realised, however, that the same symptom or symptom-complex could arise in association with lesions at different levels in the nervous system and as a result of different pathogenic actions. He had then, under the influence of teachers of 25 years ago, attempted to rely on the well-tried clinico-anatomical method, to correlate symptoms observed during life with lesions found after death. The method had value, for such correlation was (with certain provisos) legitimate enough and its employment had led to important discoveries and advances. Now, however, he was convinced that neither a clinical nor a pathological classification offered any particular advantage from the standpoint of nosology and that the sole basis for the scientific arrangement of nervous disease was ætiology. This was precisely the department of research which had lagged behind, and the causation of a large number of nervous affections was undiscovered. Until it was possible to prove that a given causative agent produced invariably and solely the same reaction in the body, distinct from other reactions and amenable to the same treatment, it would be impossible to establish disease entities.

Physiological Nature of Symptoms.

An ætiological factor—a pathogenic agent—could be regarded physiologically as a stimulus, and physiology recognised only three classes of stimuli: pure excitants, pure depressants, and those which first excited and then depressed. Clinical symptoms, therefore, represented either excitation or cessation of function or a series in which cessation followed excitation. All symptoms were functional in the sense of being related to function, and the attempt to distinguish functional from organic symptoms was therefore meaningless. Moreover, a symptom, being the expression of a physiological reaction, could not be specific, for the great diversity of stimuli showed that reactions themselves could not be specific. An Argyll Robertson pupil was just as characteristic of collicular neoplasm as of neurosyphilis, and he had seen every single symptom of hydrophobia manifested in a case of tetanus. Again, a symptom, being the expression of an active process, was in essence fluctuating and variable, whether it was "functional" or "organic." The tremor of paralysis agitans was as patently influenced by psychical stimuli as that of hysteria. Only when a structural change was permanent and tissue reaction had come to an end did a given symptom become "fixed." It therefore bore no constant relationship to underlying structural alterations. The conclusion was unavoidable: that symptoms were the expressions of dynamic alterations in function, and might or might not coincide with structural change; and that symptoms due to dynamic or to static change could not be differentiated.

The clinico-anatomical method was beset with pitfalls. In the first place, it was necessary to consider the precise nature of the semiological picture during life; whether the symptoms corresponded to enhanced or diminished function. Stimulation of function could not be associated with destructive lesions; they could only abolish function. "Positive" symptoms, on the other hand, could only be produced by the action of healthy mechanisms. It was illogical to attribute the involuntary flexor spasms of a case of paraplegia to lesions in the pyramidal tract; they could only occur if the lower spinal reflex arcs were sound. Jackson had said that the tabetic walked badly, not with his withered dorsal funiculi, but "with what of his spinal cord is left." The problem of all involuntary movements was physiological and would never be solved by ascribing them to destroyed cell-fibre systems. Secondly, there was no constant relationship between the size of the lesion and the amount of functional disorder. The enormous functional disturbance of a generalised major epileptic seizure bore no relation to any lesion that might be found afterwards, and many gross lesions such as cerebral tumours were unaccompanied by symptoms. Thirdly, the localisation of a symptom, a functional system, and a lesion were different and separate things; they were not comparable, could not be superimposed, and obeyed differing rules of localisation. Fourthly, the clinico-anatomical method took no account of time. The fact that the cells of the substantia nigra might be destroyed in four days in rabies and in three weeks in acute epidemic encephalitis made it very doubtful whether the parkinsonian syndrome could be attributed to their absence. A syndrome the unrolling of which involved the idea of succession in time could not be localised by spatial rules. There was no localisation of the inverted sleep-rhythm in post-encephalitis; its localisation, like that of a tune in a musical-box, was chronogenic. The mutual independence of lesions and symptoms threw light on the true nature of "disease," a term which Dr. Wilson preferred to replace by "reaction."

Even neuropathological changes were not specific; they might be classifiable, but they were nothing more than reactions to noxious agents and the features of any one were common to many others. Prof. Spielmeyer had pointed out recently [1] that the most varied injuries finally led, by a more or less long chain of causes, to the same pathophysiological process.

In conclusion, it was imperative to regard disease processes, whether of activity or depression, as indications of vital efforts to cope with noxæ; many symptoms were signs of health and many lesions were evidence of attempts at repair.

Dr. MACDONALD CRITCHLEY, Dr. P. C. CLOAKE, Dr. L. KUBIE, Dr. J. G. GREENFIELD, Dr. F. PARKES WEBER, and the PRESIDENT complimented Dr. Wilson upon indicating a point of view from which a new insight would undoubtedly be gained into many aspects of neurological disease.

Dr. E. ARNOLD CARMICHAEL then read a paper, composed by himself and Mr. J. PATERSON ROSS, entitled

RADIUM AND NERVOUS TISSUE: AN EXPERIMENTAL STUDY.

The authors had studied the effect on the brain tissue in rabbits of radon seeds buried in the dura mater and laid upon it, and of radium needles laid upon the dura mater. The results of the first series of experiments had been discarded because of the impossibility of distinguishing hæmorrhage due to trauma from that (if any) due to the radium emanations. The second series had been controlled by the application to certain rabbits of empty containers, which had caused no changes. In the brains to which active seeds had been applied there had been slight congestion of the neighbouring tissues in three hours, and the microglial cells had shown some resistance to staining. At the end of six hours the endothelial vessels had shown definite fatty changes, and difficulty had been found in staining the cells immediately below the seed. After nine hours the condition had spread deeper into the brown substance and over the surface of the cortex; there had been an extravasation of polymorphonuclear leucocytes. After 16 hours the lesion had still further extended in area and depth; the vessels were congested and leucocytic extravasation had taken place below the meninges. After 20 hours hæmorrhages were present and there was considerable swelling of the microglial cells round the edge of the lesion, which was wedge-shaped with its base on the cortex. The grey matter in the centre stained very poorly and it was possible to make out the nerve-cells only with difficulty. After 24 hours the hæmorrhage had increased and was visible macroscopically on the cortex; the neurone fibrils in the neighbourhood of the seed were unstainable and one of the myelin sheaths had disintegrated; moreover, at a distance the myelin seemed to have suffered more than any other part of the nervous system.

A series of experiments had then been carried out on the later results of the application of radon seeds of 0·3 and 0·5 mm. platinum filtration. With 0·3 mm. of filtration the size of the lesion had progressed up to 212 hours both in depth and area, hæmorrhage being observed macroscopically. The changes had progressed downwards as far as the ventricle. After 40 days the lesion had changed in character; the hæmorrhage tended to disappear and was replaced by a whitish material with a ring of congested vessels. The necrotic area became detached and the lesion tended to heal. The period of 212 hours appeared to be coincident with the projectivity of emanations from

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[1] Mayo Foundation Lecture, December, 1929.

Reviews and Notices of Books.

MOBILIZATION OF ANKYLOSED JOINTS BY ARTHROPLASTY.

By W. RUSSELL MACAUSLAND, M.D., Surgeon-in-Chief, Orthopædic Department, Carney Hospital; and ANDREW R. MACAUSLAND, M.D., Orthopædic Surgeon, Carney Hospital, Boston, Massachusetts. Philadelphia: Lea and Febiger. 1929. With 154 engravings. Pp. 252. $4.

Dr. Russell MacAusland, on whose shoulders the orthopædic mantle of Murphy seems to have fallen, shares with Dr. Willis Campbell probably the honour of being the best-known American exponent of the art of making new joints. Formerly the joints of the upper extremity when stiffened by disease attracted surgical efforts for their cure. This was because the disability resulting from a stiff elbow, wrist, or shoulder is far greater than that from a stiff knee or hip, supposing that any of the last-named joints are ankylosed in a favourable position. The knee, which depends so much for its stability upon the restraint of ligaments, long seemed an unfavourable field for arthroplasty, till Putti, of Bologna, improved upon the pioneer work of Murphy. The success of his attempts reminded us of the fact, which had nearly been lost sight of, that muscles play an even greater part in the control and support of joints than do ligaments, and that their action is capable of taking the place to a very great extent even of such a complicated arrangement as the ligaments and cartilages of the knee-joint. The differences of function of the upper limb from the lower affect the prospects of attempts to restore movement in a case of ankylosis, for a weight-bearing joint like the knee requires a much greater degree of stability than one like the shoulder, of which the weight-bearing function is quite subsidiary.

This book is divided into four parts. The first is on ankylosis, its causes and treatment, including a useful discussion of what the authors call the *functional* position of various joints, by which is meant that position which allows of the most extensive performance of the functions of the limb, despite the stiff joint. The second part is on arthroplasty in general. The writers here maintain that an arthroplasty is not an excision, but something quite different. The point is not very important; we ourselves hold that an arthoplasty is an excision, but one specially modified for the special purposes of procuring movement with stability. The historical portion of this part is of much interest and value. The authors give full credit to other operators, and the work of previous and contemporary surgeons receives due notice. Under the heading indications and contra-indications much valuable advice, the fruit of a wide experience, is offered to the reader. Part III. deals with the arthroplasty of specific joints; here eight joints are discussed, but the authors lay it down elsewhere as a categorical rule that there are practically only five joints in which mobilisation is justified—namely, the temporomaxillary, the elbow, the knee, the hip, and the first metatarsophalangeal joint. As regards this last, we believe that those surgeons are right who hold that a free excision of the head of the metatarsal bone gives the best obtainable result, and we would thus reduce the number of joints suitable for arthroplasty to four. The authors hold that "in only very rare instances are the shoulder and the wrist subjects for mobilisation, and under no circumstances is arthroplasty to be considered in the ankle-joint." Part IV. is devoted to a consideration of the prevention or minimisation of ankylosis. Operators in general, including the authors, Putti, Willis Campbell, and others, nowadays use free flaps of fascia in arthroplasty. The old theory of Murphy that the flap needed an isthmus connected with its site of origin for its nutriment has been proved to be fallacious. There is still room for some doubt as to what becomes of fascial flaps in successful arthropathies. The balance of evidence inclines to the theory, supported by the authors, that the fascia is transformed into a connective tissue which acts as a covering for one of the articular surfaces.

This valuable monograph is well illustrated, and the various operative procedures are fully described.

HEREDITY AND PARENTHOOD.

By S. C. SCHMUCKER, Ph.D., Sc.D. London: Macmillan and Co., Ltd. 1929. Pp. 322. With 42 figures. 10*s.* 6*d.*

THERE are perhaps quite enough books nowadays on heredity, sex, and sex relationships. But there is still room, we think, for one written in the admirable temper of Prof. Schmucker. He gives, professedly for those with little or no biological knowledge, a straightforward, easy account of inheritance and sex. It does not everywhere reach a very high standard of accuracy in detail; the bursting of a boil, for example, is not achieved by just the mechanism which he describes on p. 144. But he tells his tale with singular clearness, and the whole is imbued with a dignity, restraint, and simple human kindliness which is particularly welcome in these times.

ÉTUDES NEUROLOGIQUES.

Troisième série. By GEORGES GUILLAIN, Professor of Diseases of the Nervous System in the Faculty of Medicine of Paris; Physician to the Salpêtrière. Paris: Masson et Cie. 1929. Pp. 453. Fr.70.

WE have had occasion to review from time to time the volumes of neurological contributions made by the present holder of the Charcot chair in the Paris faculty, who is a worthy successor to Raymond, Dejerine, and Pierre Marie. Prof. Guillain again places the neurologist in his debt by a further series, embracing papers of outstanding interest, most of which have appeared during the last few years. Three are devoted to infection with cysticercus, a condition seldom seen in this country but well known from the work of mid-European investigators. A somewhat provocative and controversial paper deals with the apparent occurrence of Jacksonian epilepsy in association with lesions of extracortical site. While this does not constitute a clinical novelty, it must require careful and critical consideration. Absence of macroscopical change at operation cannot of itself invalidate the usual conceptions of Rolandic localisation, and the instances here brought forward by Prof. Guillain seem to have belonged mainly to a vascular class. In none of them do we think it absolutely proved that the motor cortex was not physiologically influenced in direct fashion by lesions in its vicinity. A readable contribution discusses the comparatively rare syndrome of Foville, which Prof. Guillain shows may occur simultaneously on the two sides. Polyneuritis cranialis is another topic of interest, a descriptive account being furnished of the syndromes associated with lesions at various foramina of the skull and in other spots where cranial nerves are in apposition. The clinico-anatomical method, traditional in the French school, is here seen at its best; while the charming style of the writer and the lucidity of his language enable us almost to imagine we are sitting in his clinic, and must surely attract all students and practitioners of neurology.

VACCINE THERAPY.

Immunisation locale contre la tuberculose par voie cutanée. By J. DEKKER. Amsterdam: H. J. Paris. Pp. 108 and plates. 7s. 6d.

THIS book, which has a foreword by Prof. Besredka, consists almost entirely of a record of cases treated by the author's special method of vaccination. The vaccine is administered by placing 6 drops of vaccine on to two skin scarifications of 8 cm. length, after a preliminary test scarification of 1 cm. length. Vaccine A consists of a mixture of tuberculin and an emulsion of dead tubercle bacilli. Vaccine B has in addition staphylococcus, streptococcus, pneumococcus and the influenza bacillus. One hundred cases are recorded. The history of the patient, together with the symptoms, is given in all cases, but the physical signs are only briefly enumerated, and very few laboratory tests, such as the finding of tubercle bacilli in sputum or other excretions, appear to have been used to clinch the diagnosis. Radiograms were taken in a considerable number of cases; a small collection of radiograms of pulmonary cases before and after treatment is given, also photographs of one lupus case before and after treatment. The work does not appear to be very well documented, and it is difficult to arrive at a satisfactory assessment of the value of the method of treatment from a mere perusal of the book. The author is himself evidently fully convinced.

LIPPINCOTT'S POCKET FORMULARY.

Second edition. By GEORGE E. REHBERGER, M.D. London: J. B. Lippincott Company. 15*s*.

THIS book, of suitable size for a capacious pocket, though hardly what one would like to carry constantly, is a satisfactory sample of the literature on which the practitioner should consult when faced with the treatment of some disease with which he is not familiar, or of one on which he has exhausted his usual remedies. In the first half diseases are given in alphabetical order with a plentiful list of prescriptions and suggestions. The author himself seems to be in doubt whether they are not too numerous, but the essential thing in such a compilation is completeness. The second half of the book is divided into three parts, containing respectively the drugs given in the U.S.P. (tenth edition). National Formulary, and the New and Non-Official Remedies. It is a useful book brought well up to date in this edition.

Reports and Analytical Records.

THE GERMICIDAL ACTION OF DIMOL INTESTINAL ANTISEPTIC.

(MANUFACTURED BY THE DIMOL LABORATORIES, LTD., 40, LUDGATE-HILL, LONDON, E.C.4. DISTRIBUTED BY MESSRS. SANGERS, LTD., 258, EUSTON-ROAD, N.W.1.)

WE have been asked by Captain Ainslie-Walker, of the Dimol laboratories, the originator of Dimol Intestinal Antiseptic, to examine the germicidal action of the antiseptic in any manner which might suggest itself to us and to report our findings to the medical profession. An independent bacteriologist was asked to carry out these tests, and he has reported as follows:—

It is manifestly useless to endeavour to conduct experiments in such a manner that *in vivo* conditions are simulated. It was thought, therefore, more satisfactory to deal with *in vitro* tests.

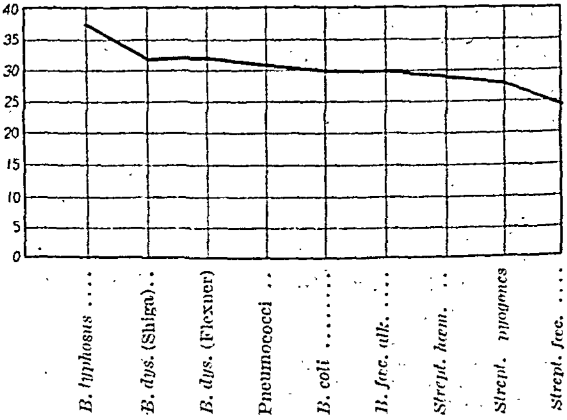
Dimol antiseptic is a granular powder of brown colour having a heavy, phenolic odour. It is sparingly soluble in cold water, but if treated correctly yields a very fine emulsion. This is highly satisfactory since it is well recognised that, from the germicidal point of view, a good emulsion acts more efficiently than a true solution. The makers recommend that the powder be rubbed up with a little cold water into a smooth paste and then diluted with water at 70° C., the emulsion being kept in a water-bath at this latter temperature for a few minutes.

Prepared in a proper manner it was found possible to obtain an emulsion which actually gave a higher Rideal-Walker coefficient, using *B. typhosus* as the test organism and carbolic acid as a standard, than is claimed by the inventor of the preparation; with such a good emulsion a figure of 37 was obtained compared with the factor 35 claimed. The method of preparation of the emulsion affected very considerably the result obtained in Rideal-Walker tests, and it is important that the directions of the manufacturers should be followed closely. Good emulsions then remain perfect for more than two weeks.

1. *Determination of the Rideal-Walker coefficient of Dimol using organisms isolated from the fæces.*—For these experiments typical strains of the organisms tested were isolated from fæces examined in the laboratories of a large general hospital. The Rideal-Walker technique was followed closely; any variations lay chiefly in the direction of media suited to the growth of the organisms under test; 0·5 c.cm. of the test culture was used as inoculum in the medication tubes. The values so obtained were as follows:—

Test organism.	Rideal-Walker coefficient.
B. typhosus	37
B. dysenteriæ (Shiga)	34
B. dysenteriæ (Flexner)	34
Streptococcus fæcalis	24
,, *pyogenes*	27
,, *hæmolyticus*	28
Pneumococci	32
B. fæcalis alkaligenes	30
B. coli	30

When viewed in the form of a graph the coefficient show a remarkably level line, only dipping slightly in the case of *Streptococcus fæcalis*, an organism most probably of little clinical importance.



2. *Determination of the degree of dilution of the antiseptic leading to death of the organisms in 15 minutes.*—These tests gave the following figures:—

B. typhosus	1:6500
B. dysenteriæ (Shiga)	1:6250
B. dysenteriæ (Flexner)	1:6000
Streptococcus fæcalis	1:5500
,, *pyogenes*	1:6000
,, *hæmolyticus*	1:6000
Pneumococci	1:7000
B. fæcalis alkaligenes	1:6000
B. coli	1:5000

These figures are interesting as showing that, with a longer time factor, all the organisms closely resemble one another. All the tests were carried out at body temperature, 37° C.

3. *Examinations for toxicity.*—Some difficulty was met with in feeding experiments with animals. Single doses up to 0·02 g. (equivalent to 1/3 gr.) per kilogramme body-weight were given to rabbits without producing toxic effects. Such a dose corresponds to grs. 20 for a man weighing 10 stone, five times the dose advocated for therapy. No evidence of absorption as shown by carboluria was obtained. Repeated doses equivalent to two and a half times those recommended in therapy also failed to produce ill-effects when given three times daily over a period of four weeks.

Conclusions.—(1) Dimol intestinal antiseptic is found to possess a very high Rideal-Walker coefficient against the commoner organisms infecting the intestine. (2) The antiseptic kills completely these organisms in 15 minutes in dilutions ranging to 1 in 7000. (3) The preparation shows no evidence of producing toxic effects in animals even when given in very large doses. No carboluria was produced.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 22, 1930.

SURGICAL ACCESS TO THE CHEST.

UNTIL fairly recently the chest was regarded as out of bounds to the surgeon because it was thought that, apart from such operations as those required for acute and chronic empyema, any surgical interference would almost certainly result in rapidly fatal spontaneous pneumothorax. Nowadays, the thoracic surgeon is widening his field of activity, and operations which were undreamt of at the beginning of the century—such as the removal of tumours of the lungs, pleura, and mediastinum, and the draining of deep-seated pulmonary abscesses—are becoming commonplace. Lobectomy and even pneumectomy have been attempted, although the immediate operative mortality has not been reassuring.

The very real advance in thoracic surgery can be estimated by studying and contrasting the surgical text-books of the early part of the present century with those of the present day. The progress made is indeed striking. The reasons underlying this rapid increase in knowledge and interest in pulmonary disease are many. Among the most important is the development of radiology with its concomitant use of lipiodol for the purposes of diagnosis. Improved bacteriological and chemical methods have contributed largely to better diagnosis. The general adoption of artificial pneumothorax in the treatment of pulmonary tuberculosis and allied conditions has not only been of great value from the therapeutic standpoint, but has also been of assistance to the radiologist in his diagnosis of such conditions as new growths of the lung, and benign tumours of the mediastinum. The surgeon has been able to attack more easily such conditions as growths of the thoracic portion of the œsophagus and mediastinal tumours, when the lung has been previously collapsed artificially. Much has been learnt also of the mechanics of respiration and gaseous exchanges. Amongst other things it has been shown that a patient can have a considerable degree of collapse of both lungs with no appreciable embarrassment of the respiratory or cardiac functions. All these factors have led to an increased clinical interest—as, for example, in the correlation of physical signs with radiological appearances—and also to an added interest in the study of physical signs for their own sake. But it was the late war which afforded the greatest stimulus to the study of chest surgery, for it yielded a concentrated mass of clinical cases with wounds of the chest of every description, and brought forth a new conception of the physics of the lungs and pleural cavities. Such conditions as massive collapse of the lung following injury, and surgical infections of the lungs and pleura were studied in great detail. It was seen quite early in the war that a soldier with an open pneumothorax did not necessarily die immediately, and that, on the contrary, many such cases recovered completely. The modern view arising out of war experience of the mechanics of open pneumothorax is that if an opening in the pleura is of smaller extent than the aperture of the glottis, the lung collapses gradually, and the intrapleural pressure remains negative. This type of pneumothorax does not cause respiratory embarrassment. If, however, the communication through the pleura with the outside air is larger than the aperture of the glottis, the lung collapses suddenly, and the mediastinal contents are displaced to the opposite side by the negative pressure set up by inspiration. On expiration, when the pressure becomes positive, the mediastinum returns to its original position, and in this way a to-and-fro flapping movement is produced, leading to disturbance of cardiac and respiratory function and characterised by cyanosis, dyspnœa, and irregular action of the heart. Before the war efforts had been made to prevent the possibility of fatal pneumothorax in operations on the chest, notably by SAUERBRUCH with his negative pressure operating chamber (hypo-atmospheric method) and by MELTZER, who introduced the intratracheal insufflation method by which the anæsthetic, mixed with air or oxygen, is pumped above atmospheric pressure through a catheter in the trachea into the lungs (hyper-atmospheric method). In this country only the latter method, or modifications of it, are now used.

During the past ten days in London a great deal of discussion[1] on respiratory diseases has been taking place. At the Royal College of Surgeons, the President of the Royal College of Physicians delivered a Hunterian Lecture on Massive Collapse of the Lung. The Section of Surgery of the Royal Society of Medicine discussed the question of Intrathoracic Tumours, while the Section of Anæsthetics, in conjunction with surgeons, held a discussion on Anæsthesia in Thoracic Surgery. The Medical Society of London dealt with the surgical methods of collapse of the lung, accessory or alternative to artificial pneumothorax, and Dr. GUSTAV MAURER, of Davos, read a paper on the Surgical Treatment of Pulmonary Tuberculosis, in which he referred mainly to the nature of adhesions in artificial pneumothorax and his "two puncture" method of dividing them. The value of cutting adhesions in artificial pneumothorax in order to obtain complete collapse of the lung is a matter on which opinions are divided. Frequent endogenous infection of the pleural cavity leading to empyema and tuberculous exudate brought the method, first instituted by JACOBÆUS, into some degree of disrepute. It is doubtful whether adhesions in the majority of pneumothorax cavities prevent a good functional result. The basic idea underlying collapse therapy is not, as might be supposed, to rest the lung completely, but in order, as STUART TIDEY[2] has pointed out, to release the edges of the ulcerated area from the tension of the surrounding lung tissue, and thus to promote healing. It has been shown by UDAONDE and VADONE[3] that a completely collapsed lung is never at rest. In some cases the presence of adhesions prevents a good functional result. The figure of 37 per cent. given by GRAVESEN and the MATSONS is, of course, purely arbitrary, as it depends on the type of case selected for the treatment. MAURER, in his classification of adhesions found in these cases, shows that, in the majority, devitalised lung tissue is caught up in the adhesion, which if divided through the tissue of the lung allows endogenous organisms to infect the pleural cavity. From this fact he makes the interesting point that in order to prevent endogenous infection, the adhesion must be divided as close to the parietal pleura as possible. MAURER'S method should give the best results in those cases in which adhesions prevent the collapse of pulmonary cavities, but unfortunately in many of those cases a type of adhesion exists which finds no place in his classification—viz., those in which the lung is firmly adherent over a wide area to the parietal pleura with no demarcation between the pleura and the lung tissue. It is these cases in which an attempt to divide the adhesion would be most dangerous. The difficulties which adhesions set up in artificial pneumothorax seem to suggest that the best time to institute the treatment is at the earliest possible moment, without trying more conservative methods of treatment and allowing adhesions to form. It is true, however, that often by the time that the patient consults his doctor adhesion between the pleural layers has already taken place.

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[1] See THE LANCET, Feb. 15th, pp. 331, 346, 349, 352, and 355.

[2] Compression of Lung in the Treatment of Pulmonary Lesions (London, 1927).

[3] Arch. méd.-chir. de l'appar. resp., 1928, iii., 363. See also THE LANCET, 1929, i., 621.

It is a curious fact that artificial pneumothorax, a minor surgical operation, is considered in this country and elsewhere to come within the province of the physician. But it is really an indication of the fact that for the successful diagnosis and treatment of pulmonary disease, a team of skilled workers, consisting of physician, surgeon, radiologist, laryngologist, anæsthetist, and bacteriologist is necessary. On the Continent there has appeared the chest specialist who is a physician-surgeon-radiologist, and in isolated instances in this country the same combination is to be observed. The success of a team depends on the individual members of it, and under Utopian conditions, no doubt, would be of greater efficiency than the man who might be somewhat irreverently termed the Pooh Bah chest specialist. But there seems to be no reason why the man who has specialised thoroughly in chest diseases should not be able to combine both medicine and surgery and perhaps radiology of the respiratory system.

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SLUM CLEARANCE AND THE RATING SYSTEM.

On Wednesday in last week a resolution was moved in the House of Commons which asked the House to regret the excessive burdens placed on the occupiers of new houses by the present rating system, as well as by street-paving charges, while the detrimental effect of these burdens upon future housing activities was clearly pointed out by the participants in the debate. The object of the resolution was to urge the Government to consider proposals for some scheme of adjustment or modification of rates, when the question of housing came up for future legislation, an event that is due to occur promptly. For in the King's Speech at the opening of Parliament the promise was made that an extensive programme of slum clearance would be promoted, and, of course, the clearance of the slums means the construction of accommodation for the dislodged inhabitants.

It is an unfortunate fact that until now the rents, with the accompanying rates, demanded for any new houses, are usually—it might almost be said invariably—in excess both of what any previous slum-dweller has paid or what he can pay. This is not to say that there is any systematic extortion about the rent charges, for their scale can be shown to depend mainly on the cost of land and building. But the rates and other charges are dictated by the rent, and the total cost to the tenant is such that those who should benefit by slum clearance are unable to do so. The resolution before the House was moved by Mr. Philip Oliver, who suggested a way out of this dilemma through a system of differential rating, with a communal charge for any cost of street-making which could not be regarded as due to the requirements of the residents of that street. Mr. E. D. Simon, in seconding the resolution, appealed to the Minister of Health to deal bravely, in connexion with the forthcoming Housing Bill, with the present system of rating, which he described as faulty and antiquated. But an intervention from Sir Kingsley Wood here raised the important point that to deal with the question of rating in a Housing Bill, according to the lines proposed by the supporters of the resolution, would unduly burden a large number of working men and women who were already making a fair contribution as taxpayers to the State support of housing development. To some extent the Minister of Health was in agreement here, for he pointed out that the gist of the resolution was to obtain a further subsidy from the State, whether by means of derating or by reducing the road-making charges or both, while at the present moment the State was already contributing something like one-third of the cost of the publicly assisted houses now under construction. Mr. Greenwood did not defend the system of rating—indeed, he condemned it in general terms, but he said that he could not see the justice of derating the persons who happened to be fortunate enough to live in new houses at the expense of those who lived in the old houses. It is clear that the problem of rating will not be dealt with in connexion with the new housing scheme.

The probability is that the movers and supporters of the resolution, which was agreed to by the House, did not anticipate that the many social problems which will naturally come up for discussion under the Housing Bill would be added to by including rating questions in the measure. But it is to be hoped that Mr. Greenwood, as an important member of the Government, will see that the representations on the subject will not be forgotten, and will make their appeal in some more appropriate manner. The housing shortage is being met; the absolute dearth is being replenished, more satisfactorily in some areas than in others, and we may expect that the results will be expressed to some extent in vital statistics. This should encourage the Government to think comprehensively in their contemplated measure, recognising that the housing difficulty continues to be an effective obstacle to the promotion of public health.

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THE TREATMENT OF URÆMIA.

Of the more immediate causes of death which occupy the attention of the practitioner, uræmia is one of the most frequent and striking, and the informal discussion on its treatment which took place at the Royal Society of Medicine last week is of importance to all branches of medical practice. A full report of this discussion, in which several sections of the Society took part, appears in other columns of our present issue. The term uræmia is admittedly inexact and covers a very large number of phenomena, but there is general agreement that serious failure of renal function is an essential part of any syndrome which may properly be included in this term. The main groups of symptoms to which this name is applied are familiar enough, whether it be the group with convulsions and amaurosis, with renal asthma or marked respiratory manifestations, or with prominent cerebral and gastro-intestinal symptoms. Intensive study should, in course of time, tend to increase our knowledge sufficiently to enable us to define with some exactitude the changes in the chemistry of the body fluids which underlie these varying syndromes. Possibly this increased knowledge may enable the expert of the future to separate the group of definitely irrecoverable cases from others in which it is possible with some certainty to institute effective therapy. Although, as Prof. F. G. LANGMEAD pointed out in opening the discussion, uræmia is only too often a late symptom of an incurable disease, it does sometimes manifest itself to us as an acute disturbance threatening life in a patient in whom the renal damage is not, in itself, incurable. Cases of acute nephritis in children are sometimes attended with uræmia, the treatment of which has been followed by a large and sometimes permanent measure of repair to the nephritis and consequent restoration to perfect health. Urologists, again, are acquainted with the alarming manifestations of acute renal failure which sometimes follow stages in the operative treatment of prostatic obstruction, and they have seen such patients enjoy good health for years afterwards if the menace of the immediate attack can be held off. It would, therefore, seem that in uræmia it is important for the practitioner to form a sound estimate of the amount of permanent damage present in the kidneys of a patient he is treating; if he is able to satisfy himself that this damage is not irreparable it becomes of urgent importance for him to adopt the proper measures for counteracting the acute crisis which is superimposed.

A cloud of uncertainty still hides from us the exact interpretation of uræmic symptoms, although it may be stated with little risk of contradiction that twitchings and convulsions are evidences of disturbed calcium metabolism, that uræmic asthma and air-hunger are usually an indication of a lowering of the alkali reserve of the blood, and that uræmic coma is, at least in many instances, an expression of increased intracerebral tension. In the discussion already mentioned, Dr. IZOD BENNETT expressed the opinion that vomiting, which is often so prominent a feature in surgical cases, is not infrequently the cause of death owing to the progressive dehydration of the patient. He had, he said, seen life saved on many occasions by the energetic exhibition of drugs, such as the barbituric acid compounds, or even morphia, which would prevent vomiting of this type. Dr. E. P. POULTON, Dr. LANGDON BROWN, and several other speakers emphasised the importance of diet in uræmia, whether threatened or actually present. While it is true that nitrogen retention may be present for years without the production of uræmia, and equally true that the most rigorous diet, with reduction of proteins to a bare minimum, is powerless to prevent nitrogen retention once this has occurred, there was general agreement that anything approaching a moderate protein diet, let alone a high one, might rapidly be followed by disaster. A possible alternative explanation of this was advanced by Dr. A. OSMAN, who instanced the acid-producing tendency of protein diets, a subject on which we must look to the future to supply exact knowledge; it is, however, already clear that a diet which tends to keep the reaction of the blood close to its physiological normal level without effort on the part of the kidney is clearly desirable in all cases where its function is impaired. Many speakers of experience who contributed to the discussion emphasised the need to promote excretion by purgation, by sweating, and possibly by venesection, but they were careful to qualify their statements by an admission of the frequent inefficacy of such measures when applied alone. Coöperation with the biochemist will long be required before the physician can regard the therapy of uræmia with satisfaction.

Annotations.

"Ne quid nimis."

ANOTHER SCOTTISH MILK EXPERIMENT.

THE usefulness of adding milk to the diet of elementary school-children was demonstrated two years ago by an experiment in Scotland.[1] This experiment was instructive and convincing, but it was confined almost entirely to town schools and its basis was somewhat narrow. After much consideration, the Secretary of State for Scotland has therefore decided in favour of a further investigation, and this was inaugurated at Hamilton last Saturday by Mr. Tom Johnston, Parliamentary Under Secretary of State. It will involve 20,000 school-children from 100 schools in the County of Lanark. From Feb. 17th until the schools close in July, some 10,000 to 12,000 children will receive an additional forenoon ration of three-quarters of a pint of milk. Five thousand of these children will receive Grade A (" tuberculin-tested ") milk; another 5000 will receive pasteurised milk, while 10,000 " controls " will be weighed and measured but will get no added ration. Over 9000 gallons of milk will be supplied daily through the Milk Pool (Scottish Milk Agency, Ltd.) and the cost of the experiment is expected to be about £9000. Of this sum the Empire Marketing Board are to contribute £5000 and the Central Advisory Committee of the Miners' Distress Fund £2000. The investigation will serve several purposes. It will constitute a more searching test of the value of milk as a food for growing children. It will increase the consumption of milk in Scotland, which is in this respect behind many other countries. It will considerably help the milk-producing trade, and it will also do something to inform the general public of the value of standardised milk. Incidentally, it will afford relief in the depressed mining areas. The previous experiments, conducted over two years, showed some of the possible mistakes in research on a large scale, and those in charge of the present investigation will benefit by the experience which has been gained.

THE HICKMAN MEMORIAL.

AN appeal which was launched about a year ago to recognise and perpetuate the memory of Henry Hill Hickman, a pioneer in general anæsthesia by inhalation, has been repeatedly endorsed in our own columns.[illegible] Thanks to a generous response from individuals and societies the Committee, of which Dr. W. J. McCardie and Dr. Cecil Hughes are hon. secretaries, has been able to make the following arrangements. A memorial tablet, designed and executed by Mr. Eric Gill, will be unveiled in Bromfield Parish Church, near [illegible], on April 5th next, being the centenary anniversary of Hickman's burial. His grave in the churchyard will be restored and the tombstone re-lettered. A memorial medal with an endowment fund will be awarded for original work in [illegible] anæsthesia. In addition, it is hoped to [illegible]

portrait of Hickman to be pre
Society of Medicine. Finally,
has made a valuable collect
connected with Hickman, which
at a meeting which has been [illegible]
April 2nd, the anniversary of [illegible]
understand from Dr. Hughes [illegible]
subscribers to the fund and [illegible]
will shortly be published [illegible]
Before doing so the Committee [illegible]
have overlooked the matter, and [illegible]
is due to the discovery of [illegible]
to encourage its development [illegible]
the hon. treasurer, Mr. F. [illegible]
street, London, W.1, [illegible]

MATERNAL MORTALITY IN AUSTRALIA.

THE number of maternal deaths which occur in connexion with every thousand live births in Australia shows a steady rise since 1922, having remained more or less stationary during the previous ten years. The maternal death-rate in 1928 was 5·98, the highest yet recorded, and the Commonwealth of Australia invited Dame Janet Campbell, senior medical officer for maternity and child welfare at the Ministry of Health, to visit each of the States and to advise what measures should be tried to cope with the distressing situation. Dame Janet has now returned and her report, of which the substance was communicated verbally on Tuesday to a group of interested people, has been issued as a white paper.[1] In it she deals comprehensively with the local problem, reviewing existing facilities for maternal and child welfare and making pertinent suggestions for future action. The steady reduction of the infantile mortality of Australia from 96 per 1000 births at the beginning of this century to 52 in 1928 is an achievement to which she accords due praise. The neonatal death-rate (deaths under one month) is, however, less encouraging, and a table of death-rates of infants under one week shows that this rate is actually higher now in Australia as a whole and in all the States except Western Australia than it was 20 years ago. The significance of these deaths within a few days of birth is their association with obstetric and developmental, rather than with pædiatric causes, and it is through care of the parturient mother that improvement in the infantile mortality will be obtained. Though certain hospitals in Australia (for example, the Queen Victoria Memorial Hospital in Melbourne) have a well-organised prenatal department, prenatal work has scarcely developed at all in connexion with the fairly numerous infant welfare centres. Dame Janet Campbell's suggestions for further action include the provision of improved professional education in midwifery and antenatal and infant hygiene, since much advance will have to be made before all doctors practising in Australia are willing and competent to undertake the regular supervision of pregnant women. The expansion of the place occupied by midwifery in the medical curriculum offers more hope than the organisation of post-graduate instruction in such a large continent, where isolated practitioners may find it difficult to take advantage of any facilities provided in the great towns. As to the midwives, though the regulations for their training are similar in the different States, the practice varies considerably and the laxity of administration in certain schools requires attention.

Dame Janet condemns small training schools, where the lecture or coaching is merely an incident in the work of a busy practitioner or matron and gives cogent reasons why maternity hospitals for private patients only should not be recognised as training schools. It would be better in the long run, she holds, to train a smaller number of midwives than to allow certification after instruction which falls far below the accepted minimum requirements. In connexion with training in mothercraft, emphasis is laid on the desirability which would hardly be questioned in this country of leaving to the discretion of those responsible in each recognised institution for mothercraft the question of modifying or varying the details of instruction. "Diversity of medical opinion and practice in regard to infant feeding in Australia and elsewhere indicates that there can be no sterotyped or standard method applicable to every infant under all circumstances and suggests that the ordinary baby is tolerant of, and can even thrive upon, comparatively widely different dietaries." The administrative changes advised concern mainly the need for revision on uniform lines of the returns required on death certificates, the desirability of registration of still-births, of compulsory notification of births to the authorities concerned with infant welfare (not yet in force in all parts of Australia), and of puerperal fever.

The establishment of a maternity service whereby any woman can obtain facilities for the satisfactory conduct of a normal or a difficult confinement and the development of infant and child welfare services "under medical supervision" are also recommended. In the absence of a completely organised public health service under local authorities, Dame Janet advises: (*a*) the establishment in each State of a Division of maternity and child welfare, in charge of a whole-time medical director responsible to the chief medical officer of health; this Division might design a general and comprehensive scheme of action which should not necessarily be applicable at once in its entirety. Propaganda publicity should be encouraged and the coöperation of women's organisations enlisted. The other major recommendations made are: (*b*) the granting of subsidies, properly conditioned and adequately supervised, towards the extension and improvement of the work for maternal, infant, and child hygiene; and (*c*) the encouragement and subsidising of research into various aspects of such activities.

TETRACHLORETHYLENE AND HOOKWORMS.

IT is at last becoming possible to form a fairly sound opinion of the value for a hookworm campaign of tetrachlorethylene, the anthelmintic introduced by Maurice C. Hall and J. E. Shillinger [1] about five years ago. P. D. Lamson and his colleagues [2] have studied its anatomical and physiological effects on animals. The hepatic necrosis, so pronounced after administration of carbon tetrachloride (CCl_4), is quite absent in dogs after tetrachlorethylene (C_2Cl_4). This is so even when the stomach has been filled up by the drug, when it has been given in doses of 2 c.cm. per kg. every second or third day for several months, or when the dog has been kept anæsthetised by its inhalation for several hours. Fatty change had previously been noted in the liver, but Lamson's report suggests that it is no greater in these drugged dogs than in ordinary animals. The kidneys were unaltered in structure, nor could changes be detected in hepatic function. The experiments show further that normally the drug does not pass the dog's liver, and that this organ disposes of it without evident damage to itself. If, however, the dog be fed with fat symptoms of absorption appear; and such symptoms are indeed the rule, apart from diet, in puppies, and to an even greater degree in certain other animals. Clearly the experimental evidence cannot exclude the suggestion that absorption may take place in man.

From the clinical side P. A. Maplestone and A. K. Mukerji [3] have studied tetrachlorethylene at the Carmichael Hospital, Calcutta. Giddiness, vomiting, or drowsiness occurred in 8 of 38 hospital cases receiving 3 c.cm. of the drug. When it was combined with 1 c.cm. of oil of chenopodium these toxic symptoms appeared in 26 of 37 cases. The drugs were given in capsules, so it must be assumed that absorption occurred from the alimentary canal and that the drug passed through the liver; clinical evidence upholds the caution that the effects on the full-grown dog cannot be held fully evidential for man. These writers also investigated the worth of tetrachlorethylene against hookworms, using more exact diagnostic methods than had hitherto been employed. Counting by Stoll's caustic soda method the number of hookworm eggs passed before and after the treatment mentioned, the relative figures led to the conclusion that 60 per cent. of the worms had survived. By Clayton Lane's direct centrifugal floatation (D.C.F.) they obtained the added information that 80 per cent. of their patients remained infected, and they cite one series of 12 cases in 8 of whom Stoll's technique discovered no eggs after treatment, whereas D.C.F. showed that actually 11 of them remained infected. It is pointed out that no other investigation on this drug has employed methods exact enough to determine the extent to which it really disinfects, and the following is added: "The great superiority of Lane's method over any other for demonstrating light infections is quite sufficient to explain the low percentage of cures in the writers' cases. It was the discovery of the ridiculously low rate of complete cure that even the most powerful vermifuges bring about when checked by the direct centrifugal floatation method that led the writers to make use of the percentage reduction in eggs as a test of drug efficiency." Accurate egg-counting methods, and Stoll's is not among the most accurate, certainly give the measure of any drug's anthelmintic efficiency and form a valuable guide to the physician. They are probably of much less interest to his patient who rightly demands his own complete disinfestation; and the more clearly it is realised by both physician and patient how constantly the most popular anthelmintics fail to effect this, the more urgent will be the pressure for sustained research aiming at discovering something better. It is self-satisfying to focus attention, as is generally done at present, on a lessened egg count rather than on a gross failure to disinfest. It is more straightforward to face the fact that we have at present no sure and safe anthelmintic against hookworms.

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[1] 1929. Commonwealth of Australia Department of Health. 32 foolscap pages. Canberra: H. J. Green, Government printer.

[1] Amer. Jour. Trop. Med., 1925, v., 229.

[2] Amer. Jour. Hyg., 1929, ix., 430.

[3] Ind. Med. Gaz., 1929, lxiv., 424.

PROSTITUTION IN NEW YORK.

THE history of the New York system of prostitution is interesting. Up to 1915 the solicitation laws there were similar in effect to those now in force in London but in that year a change was made, so that solicitation for prostitution became an offence in itself, without reference to "annoyance." In New York it is now a legal offence to "commit" or "offer to commit *prostitution*," or to "*induce, entice or procure another*" to commit fornication. In 1921 a man was arrested for breach of this law, but the magistrate held that prostitution was a practice of women only, and that a man cannot be a principal under that charge. Thus only women are now liable for that offence. The January number of the *Shield*, the journal of the Association for Moral and Social Hygiene, which takes note of this position, delineates, mostly by quotation from the official American Report, the results, up to the end of 1928, of the activities of the "Committee of Fourteen," a body which was created some twenty years ago with the object of "cleaning up" New York. The report of this Committee is mainly an exposition of the working of the present system, for which that Committee is chiefly responsible; the report therefore has no hostile bias. By constant suppression of solicitation the Committee have succeeded to a wonderful extent in "cleaning" the streets. So far so good. But the Committee are now faced with a "new and unforeseen thing." A few short quotations chosen from a long series will explain what that is.

> "There has sprung up a mushroom growth of night-clubs and speakeasies. . . which have furnished commercialised prostitution with a long-wanted place and opportunity. . . These provide at the present time the greatest source for the making of new prostitutes . . . Clandestine clubs are steadily permeating every section of the city . . . the name 'clubs' is really a subterfuge . . . Respectable and legitimate clubs have hostesses . . . the speakeasy houses of prostitution now call their inmates hostesses . . . 60 per cent. of the agencies investigated may be said to be shady, and 40 per cent. are definitely engaged in the traffic . . . One of the requirements specified by proprietors of clubs and speakeasies seeking hostesses is that they must be 'regular' . . . Instead of a white-slave traffic, the traffic is what might be termed a traffic in hostesses . . . The interchange of girls in the clubs is rapid . . . It would seem that the low-class clubs and speakeasies are virtually prostitution mills. . . Those hostesses are most valuable . . . if they will become what is called 'reasonable.' . . . Perhaps one of the most important factors is . . . the taxicab drivers, runners and doormen, who secure a percentage for introducing male guests . . . The demand (for girls) is so great that there are not nearly enough ready-made-prostitutes to supply it; hence the recruiting through employment agencies . . . There is a definite tie-up between clubs and call-flats . . . "

Commenting on the activities of the New York Committee, the *Shield* remarks that they set about cleaning up the streets before public opinion was improved, and thus prostitution has been driven underground. Not but that the police are in full cry; the number of women dealt with under charges of prostitution increases yearly; 1928 far exceeds the record of previous years. The result for the woman depends on whether she be suffering or not from venereal disease; if it is a first conviction, and she is diseased, she goes to the Avenue Hospital for an indeterminate period till she is considered no longer dangerous; for a subsequent conviction, the penalty is 100 days, or an indefinite commitment to a reformatory. Severe as these punishments are, the evil grows steadily. The Committee of Fourteen suggest as their desiderata: prohibition of all employment of females in restaurants, including those employed as singers or performers; increased allowances for police investigators; abolition of "closed" dance halls, and closer supervision of dance palaces. The fact is that the Americans have decided to move steadily along the line of suppressing prostitution; of clearing prostitutes off the streets, and subjecting them (not their male partners) to severe penalties. The report indicates that the evil is progressing under very disturbing forms. It is not the first time in history that suppression has been vigorously tried, nor the first time (if it prove so) that it has failed. Whatever view we take of it, this report, or at least the *Shield* account of it, ought to be in the hands of all who take a practical interest in the likely revision of our own solicitation laws. In this country the Street Offences Committee have published their report; a lot will depend on how far and in what manner its recommendations are given the force of law. It may be desirable to clean the streets, but it is far more desirable to clean *public opinion*.

EYE DISEASES IN CHINA.

AMONG the earliest practitioners to place Western medicine upon a sound footing in China were two very able ophthalmic surgeons, Dr. T. R. Colledge, of the British East India Company, and Dr. Peter Parker, an American missionary. Both of them founded eye hospitals in Canton and elsewhere, and Dr. Parker, between 1834 and 1844, performed numerous operations for cataract which keep alive his memory to this day as one who restored sight to the blind. The tradition thus started has continued down to our own time. The Peiping (Pekin) Union Medical College, founded in 1921, has established a department of ophthalmology which has brought in succession the renowned Ernst Fuchs, his son Adalbert Fuchs, and now Prof. Arnold Pillat, to develop its activities. The object is not so much to train ophthalmic specialists as, in view of the important rôle played by eye diseases in China, to make the native doctors more capable of dealing with the eye cases they are certain to meet in large numbers. They will then be better equipped than if they had only received the scanty tuition in the subject given in the ordinary curriculum. The *National Medical Journal of China* for October, 1929, is a special "eye number" and contains two articles by Dr. Pillat on the results of treatment of eye diseases by Chinese quacks. Their methods, which embody traditions dating from remote antiquity, frequently inflict quite gratuitous injuries on the unfortunate patients. In spite of the amount of blindness directly traceable to these quacks they will be difficult to supplant, partly on account of the conservative instincts of the native Chinese, and partly owing to the traditional ritual with which the operative procedures are associated—mostly "needlings" either of the eye itself or of points in the face supposed to bear a relation to the eyes. Dr. Pillat calls attention to a peculiarity in Chinese eyes compared with European, in that the upper limbus is frequently exaggerated in sickle form above the cornea so that the shape of the anterior corneal surface is elliptical with a white crescent above, which by the novice may be taken for an arcus senilis, and which affects the landmarks for incision into the anterior chamber when operating for cataract or glaucoma. A third contribution from the same pen concerns the eye symptoms associated with deficiency of vitamin A in adults. In China malnutrition is so common that the disease known as keratomalacia, which in the West is practically confined to infants, frequently attacks adults and is an important factor in the total incidence of blindness. The number also contains articles by native Chinese doctors. C. H. Chow describes some rare injuries of the cornea, including one inflicted by the claws of a cat, and the use of the slit-lamp in discovering the frequency and localisation of lenticular opacities. W. P. Ling writes at length on the ocular findings in infectious diseases, such as typhus, typhoid, dysentery, kala-azar, and pellagra, carefully distinguishing those which may stand in causal relation to the disease.

THE THIRD HASTINGS LECTURE.

Sir Andrew Balfour, Director of the London School of Hygiene and Tropical Medicine, will lecture on "Health and Empire" in the Great Hall of the British Medical Association, Tavistock-square, London, W.C.1, on Wednesday, March 12th, at 8 P.M. The lecture is the third "Sir Charles Hastings Lecture," inaugurated by the British Medical Association for the purpose of offering to the public information by the highest authorities on matters of general public health interest. The first lecture was given on Jan. 24th, 1927, by Lord Moynihan on "Cancer and How to Fight It"; the second on March 21st, 1928, by Sir George Newman, on "The Foundations of Health." For the third lecture the chair will be taken by Lord Riddell, President of the Royal Free Hospital, and after the lecture relevant questions in writing will be invited. Admission will be free, by tickets obtainable on application to the Financial Secretary, British Medical Association House, Tavistock-square, London, W.C.1. Seats not occupied by ticket-holders by 7.50 P.M. will be available for other members of the public.

THE GROWTH OF CHILDREN.

Dr. Gustav Nylin has lately published[1] some observations on the growth of groups of children during a year. His data include estimations of height and weight, the standard metabolism, and the oxygen capacity of the blood, and his material consisted of Swedish school-children of various ages during the years 1926–27 and 1928–29. The measurements of height and weight were made with great accuracy under controlled conditions, the children being always examined at the same time of day so as to obviate error due to the normal daily variations. The basal metabolism was estimated by Krogh's apparatus; the hæmoglobin was estimated at the same time, and the oxygen capacity of the blood was calculated indirectly from this. The results showed that in children of varying ages there is a periodicity of growth during the year, the height increase exhibiting two maxima, of which the larger is from March to May, and the smaller from November to January. The two minima are thus from September to November and from January to March. On the whole it was found that increase of weight varied inversely with increase of height, so that a maximal rise in height coincided with a minimal rise in weight. Besides this periodicity, weight and height in boys showed a periodicity which Nylin terms endogenous; he finds that periods of increased growth tend to be followed by corresponding periods of decrease. Standard metabolism for children round about the age of six years has a periodicity, closely connected with that of height increase, in that during such periods the metabolism rises. It was noted, in the case of one child who was very carefully studied, that a close connexion exists between height increase and metabolism, for both were found to be maximal at the same time of the year and this was when sun radiation was also maximal. Corresponding variation in the oxygen capacity of the blood was also found in school-children of all ages, the minimum occurring during the dark period of the year and the maximum during the light. The latter, however, appeared several months later than the corresponding maximal and minimal metabolic variations. To test the theory that light is one of the causes of height increase, Nylin made some separate observations on a large group of children who were exposed to mercury-vapour lamps and found that such irradiation appeared to stimulate growth in height. These results are of interest in view of the recent observations in England.

SOCIAL HYGIENE.

AMONG those affected by the new Local Government Act is the British Social Hygiene Council,[1] which will no longer receive a central grant from the Ministry of Health but will depend on the subsidies which local authorities see fit to give. Appeals for such amendments of the Bill as would have safeguarded the work of the Council were not successful, but a strongly worded circular was issued to local authorities by the Minister, pointing out the necessity for contribution to propaganda from a central fund. A final grant of £12,000 has been made by the Ministry, but contributions from the local authorities will not be received until December, 1930, and the period between April, 1930, and the following December will have to be covered by voluntary subscriptions amounting, it is estimated, to £5000. The British Social Hygiene Council considers that it would be a failure in public duty to cut down expenditure during these critical months, but should the contribution of the local authorities prove to be inadequate, and should additional voluntary funds not be forthcoming, this policy will have to be reconsidered, to the detriment of a valuable service. A resolution was passed by the Council in 1929 asking that the Parliamentary Committee should consider the possibility of amending the Insurance Acts in such a way that approved societies shall be able to contribute to funds for health education under the sanction of the Ministry of Health. Should this amendment be passed it would open a valuable source of income to the Council.

The decrease in the incidence of venereal diseases during the last few years may at least in part be attributed to the work of the Council. In the Report for 1929 it is stated that the incidence of new infections with syphilis in the Army (an index of that in the civil population) was 9·8 in 1921, and only 2·6 in 1926. The report goes on to emphasise the great value of propaganda in warning the public of the dangers of venereal infection, and in bringing infected persons early for treatment. There has been in the past much difficulty in gaining for this unpopular branch of health propaganda the publicity it requires, but of late years the press has been more ready to lend its coöperation by giving prominence to the advertisements of the Council. Films and lectures have been valuable, and it is noticeable that the showing of a film is often followed by increased, and more prolonged, attendance at the centres. A sympathetic medical officer and almoner can do much to ensure the return of patients who have once attended. One of the effects of propaganda is to bring up for examination those who have been exposed to infection, many of whom are free from venereal disease; an opportunity for advice on prevention is thus offered. Many women infected by their husbands after marriage may be ignorant of their condition, or may object strongly to the thought of attending public centres. It would be advisable for such women to attend clinics run in conjunction with infant welfare centres, and provision should be made for this where possible. Distribution of propaganda to adolescent persons and to children presents a separate problem. It is not thought desirable to teach sex hygiene in school classes, and the Council aim to approach children through parents and teachers, who should attend suitable conferences and lectures. Children leaving school might be addressed, and shown such of the social hygiene films as might be considered advisable. Leaders of clubs and socials should have an adequate knowledge of the physiology and psychology of adolescence, and should coöperate with suitably qualified lecturers to provide instruction on sex for the members of the club. Mentally defective persons are liable to contract venereal diseases early, and to add dangerously to their dissemination. The Council urge that under the new Act the local authorities should provide suitable accommodation for this group and also for "border-line" cases. The work of the Council, carried on in centres throughout this country, as well as overseas in India, New Zealand, Australia, South Africa, and elsewhere, has included the efficient treatment of all cases presenting themselves, as well as a determined publicity campaign. The results achieved, on which the Council has every hope that it can yet improve, are due largely to a well-directed expenditure on propaganda, and adequate support of this policy should be a serious concern of the local authorities under the new Act.

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[1] Acta Med. Scand., 1929, Suppl. xxxi.

[1] Fourteenth Annual Report of the British Social Hygiene Council (Incorporated), Cartaret House, Cartaret-street, S.W.

THE DEFINITION OF DRUGS FOR PURPOSES OF MEDICAL BENEFIT.

ABOUT a year ago an advisory committee was appointed to consider and report to the Minister of Health upon questions referred to them as to the definition of drugs or medicines for the purposes of medical benefits under the National Health Insurance Acts. This committee, over which Dr. D. G. Greenfield presided, have now issued two reports. The first defines their memoranda of reference; they were invited to indicate that each of the substances and preparations referred to them was either *(a)* never a drug, *(b)* always a drug, or *(c)* sometimes a drug. Their second charge was to consider and advise what action should be taken with respect to (1) the practitioner, (2) the chemist, (3) the insurance committee, and (4) the insured person when substances coming under the first or third of these classes were prescribed for insured persons. They have suggested regulations which provide that an insurance committee shall have power to recover from a practitioner the cost of any substance prescribed which is *not* a drug or medicine, and shall pay the amount so recovered into the Chemists' Fund. The rest of the proposed regulation makes provision for the course of action to be pursued in cases where doubt arises, which should be referred ultimately to referees (two practitioners) nominated by the Minister. The second report gives the categories into which substances so far submitted have been placed.

THE Milroy Lectures of the Royal College of Physicians of London will be delivered at the College at 5 P.M. on Feb. 27th and March 4th and 6th by Dr. J. Alison Glover, a medical officer of the Ministry of Health. His subject will be the Incidence of Rheumatic Diseases, and any practitioner will be admitted on presentation of a visiting card.

THERE will be general regret at the announcement, made on this page, that Air Vice-Marshal David Munro, Director of Royal Air Force Medical Services, is retiring at the end of this month. Air Commodore John McIntyre has been selected to succeed him. Air Vice-Marshal Munro is taking up the appointment of secretary to the Industrial Health Research Board, under the Medical Research Council, in succession to Mr. D. R. Wilson, who has lately been appointed Deputy Chief Inspector of Factories at the Home Office.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Lt. Comdr. W. A. Jolliffe to rank as Surg.-Comdr.

Surg.-Lt. T. F. Barlow is transferred to the Permanent List.

ROYAL ARMY MEDICAL CORPS.

The undermentioned relinquish their appointments: Lt.-Col. G. A. D. Harvey, R.A.M.C., Asst. Dir. of Hygiene, War Office; and Maj. J. W. L. Scott, R.A.M.C., Dep. Asst. Dir.-Gen. A. Med. Servs., War Office.

The undermentioned appointments are made: Maj. W. B. Purdon, R.A.M.C., to be Asst. Dir. of Hygiene, War Office; and Maj. A. D. Stirling, R.A.M.C., to be Dep. Asst. Dir.-Gen. A. Med. Servs., War Office.

The undermentioned Lts. (on prob.) are confirmed in their rank: J. G. Black, D. A. O. Wilson, T. R. J. P. Kerwick, C. A. Levy, S. W. K. Arundell, and A. H. Weston.

TERRITORIAL ARMY.

Capt. C. Helm (Lt.-Col. Res. of Off.) to be Maj.

Lts. A. O'Hanlon and H. A. C. Gregory to be Capts.

The King has conferred the Territorial Decoration upon the undermentioned Officers: Lt.-Col. George Herbert Rae Gibson; and Majs. Arthur Morrell Johnson, Clement Arthur Webster, and James Alwin Colville Scott.

ROYAL AIR FORCE.

It is announced that Air Vice-Marshal D. Munro, C.B., C.I.E., Director of the Royal Air Force Medical Services, will be placed on the retired list at the beginning of next month, when he will be succeeded by Air Commodore John McIntyre, M.C.

Air Vice-Marshal D. Munro entered the Indian Medical Service as a Lieutenant in 1902. During the war he served in France and the Middle East, and besides being decorated with the C.I.E. was twice mentioned in despatches. In December, 1919, he relinquished his commission in the Indian Medical Service and was granted a permanent commission in the Royal Air Force Medical Service on taking over the duties of Principal Medical Officer, Headquarters, Royal Air Force, India. He was promoted to the rank of Air Commodore and appointed Director of Royal Air Force Medical Services in November, 1921, and has held this appointment since that date. He was made a Companion of the Order of the Bath in 1924, and in the following year was promoted to the rank of Air Vice-Marshal and also appointed an Honorary Surgeon to His Majesty The King.

Air Commodore J. McIntyre joined the Royal Army Medical Corps as a Lieutenant in December, 1915, and for his services during the war was awarded the Military Cross. On the formation of the Royal Air Force in 1918 he was granted a temporary commission as Major, and employed on medical staff duties at the Air Ministry. In August, 1919, he accepted a permanent commission in the Royal Air Force Medical Service, and subsequently served as Principal Medical Officer to the R.A.F. commands in India and at Halton. He was promoted to the rank of Group Captain in July 1927, and last year to the rank of Air Commodore.

A. H. Barzilay is granted a short service commission as a Flying Officer for three years on the active list, and is seconded for duty at the Royal Southern Hospital, Liverpool.

RESERVE OF AIR FORCE OFFICERS.

Flying Officer T. Glynn relinquishes his commission on completion of service.

INDIAN MEDICAL SERVICE.

Capt. J. W. F. Albuquerque to be Maj.

J. A. W. Ebden to be Capt. (on prob.).

Lt.-Cols. J. W. Barnett and F. H. Stewart retire from the Service.

DEATHS IN THE SERVICES.

Lieut.-Colonel William Coates, late I.M.S., who died at Hove on Feb. 11th, aged 78, was a graduate of the Royal University of Ireland, where he obtained the M.D., M.Ch., in 1876. He served throughout the Afghan War of 1878–80 and was present at the capture of Ali Musjid at the battle of Charasia and at the occupation of Kabul. He was one of the medical officers on the march of Roberts from Kabul to Kandahar (mentioned in despatches, medal with clasp and bronze star). He also served in the Mahsood Wuzeeree Expedition of 1881, and subsequently was transferred to civil surgeoncy work. For some years he was stationed at Lahore. He retired from the service in 1907.

Surgeon Lieut.-Commander Archibald Primrose Anderson-Stuart, R.N., who died at Deal on Feb. 16th, aged 34, was the eldest son of the late Sir Thomas Anderson-Stuart, of Sydney, N.S.W. He was a graduate of Sydney University and became a Surgeon-Lieutenant in the Royal Navy in 1923. After serving in the East Indies on the flagship of Admiral Sir Herbert Richmond, he was appointed to the Royal Marine Infirmary at Deal. In 1928 he served in the battleship *Benbow* in the Atlantic Fleet, and later in the cruiser *Caradoc*. He became Surgeon Lieutenant-Commander last year.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCXCIX.—TREATMENT OF BENIGN UTERINE HÆMORRHAGE AT THE MENOPAUSE.

In the normal menopause the periods either cease abruptly or become gradually more or less frequent, the loss varying in amount, until within a few months there is complete cessation of menstruation. Any excessive loss, occurring either periodically or extending over long periods, must be considered as pathological, and a careful examination and diagnosis of the general and local condition should be made immediately rather than delayed until a severe secondary anæmia or other symptoms develop. Unfortunately, a not uncommon cause of hæmorrhage occurring at the menopause is carcinoma of the uterus or its adnexæ, and it is of first importance, by means of a pelvic examination or a diagnostic curettage, to exclude its presence. In this article benign hæmorrhage alone is considered. In dealing with the various methods of treatment it is usual to group uterine hæmorrhages under various headings according to their cause. There are, however, so many varying opinions on causation and pathology that for practical purposes it is simpler to consider treatment under two headings: (1) hæmorrhage occurring in the absence of any obvious abnormality of the genital organs; (2) hæmorrhage due to non-malignant pathological conditions of the uterus and adnexæ, such as hyperplasia of the endometrium or fibromyomata or adenomyomata of uterus.

HÆMORRHAGE IN THE ABSENCE OF OBVIOUS ABNORMALITY.

Hæmorrhage occurring in the absence of any obvious abnormality of the genital organs may be due to: (*a*) deficient muscular contraction, (*b*) disturbances of the circulation, (*c*) functional disturbances of the ovary.

(*a*) *Deficient muscular contractility of the uterus*, the "metropathia hæmorrhagica" of Aschoff and Pankow, is characterised by a large, rather soft uterus, with thick walls. Theilhaber explains such hæmorrhages as due to a localised uterine arteriosclerosis, or "insufficienta uteri," accompanied by compensatory hyperplasia of the connective tissue.

(*b*) *Disturbances of the circulation* such as occur in patients suffering from heart, kidney, or lung disease. An unrecognised syphilis may be responsible for serious hæmorrhages which clear up with suitable antisyphilitic treatment. Certain blood dyscrasiæ, such as purpura, or calcium deficiency, may give rise to hæmorrhage at the menopause, also faulty blood coagulation.

(*c*) *Functional disturbances of the ovary*, such as the persistence of the Graafian follicles associated with absence of the corpus luteum, may lead to hæmorrhage. This condition is probably due to some endocrine disturbance or hormonal deficiency, and causes usually a severe metrorrhagic hæmorrhage.

Accurate diagnosis is in no field of medicine more important than here. The history of the patient, together with an examination of the heart, lungs, and abdomen, and the urine, a careful vaginal or rectal examination, and, if necessary, a diagnostic dilatation and curetting, should indicate to which of the three causes the hæmorrhage is due:

(*a*) If there is a decrease in the muscular tone of the uterus, and deficient muscular contraction, a course of ergot is indicated. This may be given as—

Normal liquid extract of ergot (physiologically standardised) in 20 min. doses three or four times daily, just before and during the periods. Or as—

"Ergot aseptic," made up in 1 c.cm. bulbs, representing ergot 2 g., and given hypodermically night and morning. Ernutin, 30–60 min. per os t.d.s., or 5–10 min. hypodermically. Tab. ergotininæ citras, gr. 1/200 hypodermically t.d.s., or tyramine, gr. ½ tablets hypodermically. Hydrastin also increases uterine contraction and may be given with or without ergot, either as liq. extract in 30 min. doses, or in a pill as hydrastin, gr. ½ or 1.

Cotarnine hydrochloride (stypticin) in tabloids, gr. ½, four times daily, or styptol tablets, gr. ¾ four times daily, are great standbys, and sometimes succeed when ergot fails. And lastly—

Pituitary gland extract (post. lobe), in sterules 0·5–1 c.cm., containing 5–10 units respectively bis die, intramuscularly.

(*b*) Here the primary cause must be dealt with and appropriate treatment prescribed. If the calcium content of the blood is deficient, a diet rich in calcium salts should be given—e.g., green vegetables, farinaceous foods, buttermilk, &c. Salt should be used sparingly, and calcium lactate, grs. 60, given daily for three weeks at a time (a teaspoonful dissolved in a glass of hot water, and one-third taken at breakfast, lunch, and dinner is a useful way of prescribing it). If the hæmorrhage is due to faulty blood coagulation, any of the commercial forms of thrombin may be injected subcutaneously. (To ascertain the coagulation time, take 5 c.cm. of blood from the arm into a test-tube, and compare with the mean time of normal blood taken under the same conditions, which does not exceed ten minutes.)

(*c*) Here *organotherapy* is indicated. There is still considerable doubt as to whether excessive menstruation is more likely to be associated with hyper- or hypothyroidism, and what part the pituitary thymus and suprarenals play. Preparations of *ovarian extract*, injected intramuscularly, and with or without pituitary or thyroid, or of *corpus luteum* may be found useful.

HÆMORRHAGE DUE TO NON-MALIGNANT PATHOLOGICAL CONDITIONS.

The commonest pathological conditions to which hæmorrhage may be due are: (*a*) glandular hyperplasia of the endometrium, and (*b*) fibromyomata of the uterus and adenomyomata.

Glandular Hyperplasia of the Endometrium.

In this condition the uterus is somewhat enlarged and hard, the bleeding is severe, and either menorrhagic or metrorrhagic in type. We have a sure and safe treatment in either deep X ray therapy or radium.

Deep X ray therapy is perhaps of greater service in this type of disease than in any other. As developed and practised at the present time it is unrivalled both for its certainty in producing an artificial menopause and its freedom from any serious after-effects. With one of the new types of apparatus, such as the 1929 Stabilivolt, the treatment can be completed in from 48 to 90 minutes either at one sitting, or if it is preferred, half the treatment can be given on two consecutive days.

The best time to choose is within ten days of the last menstrual period, the Graafian follicles being then at a younger state of development and more easily affected by X rays. The patient should be given an aperient the day before the treatment and a rectal washout on the evening before. The urine should be systematically examined, since the presence of albumin or sugar materially affects the dosage. The temperature should be normal. It is important that the skin of the abdomen and dorsum should be free from any eruption. The bladder should be empty, and the patient should have had only a light breakfast of tea and one slice of toast one and a half hours before treatment. It is desirable that the X ray room should be large, warm, airy, light, and ventilated in such a way as to secure a constant change of air in the room. The couch should be comfortable, and the lead rubber sheeting should be so arranged that only the area to be irradiated is exposed at one time.

If the uterus is only very slightly enlarged, four areas of 6 by 8 cm., one anterior and one posterior to each ovary, with an interval between 4 cm. wide, using 180,000 voltage, three M. amps. in the secondary current, a filter of ·5 Cu. + 2 al., a U.S.D. of 12·15 min., and a depth dose of 18·5 per cent. will be sufficient to ensure a permanent sterility in a woman of 45 years of age, provided her Baudelocque diameter is not more than 20 cm.; if it is, an extra field is desirable.

After such a treatment the patient menstruates as usual once, in a small percentage of cases twice, after which she shows some vasomotor disturbances such as "flushes," although these as a rule are less severe than those occurring in a natural menopause. Partly due to the cessation of the periodic hæmorrhages, and partly due to an unknown factor described by some authorities as the "Steinach effect," possibly an auto-oöphortherapy, caused by the ovaries and uterus remaining in loco the patients not only quickly regain their normal health, but in a very large percentage report "that they feel ten years younger."

Radium has much the same action, and will, in suitable dosage (approximately 1200 mg. hours), induce an artificial menopause. Indeed, it may also be called a specific for the treatment of climacteric hæmorrhage due to glandular hyperplasia of the endometrium.

Under an anæsthetic, and with surgical asepsis, posterior and anterior vaginal speculæ are inserted, the cervix carefully cleansed with weak lysol or acriflavine. It is important that no antiseptic containing a metal is used, on account of possible secondary radiation. The anterior lip of the cervix is grasped with a volsellum, and an intra-uterine sound inserted, to ascertain the length and direction of the uterine cavity. The cervical canal is then carefully dilated up to about No. 10 Hegar, and the radium introduced.

A dose of from 50 to 75 radium element is usually sufficent. This is best made up in two or three needles, each containing 25 el. and put in containers of platinum 1 mm. thick, placed in tandem in a rubber case or tube, and left in situ 22 hours. Thus a dose of 1200–1500 mg. hours is usually given.

Fibromyomata of Uterus and Adenomyomata.

For this condition we have the choice of two forms of treatment: (1) Surgical—myomectomy, or subtotal or total hysterectomy. (2) Deep X ray therapy, and in a small percentage of cases, radium. In my own series of 445 cases I did a hysterectomy or myomectomy in 231 cases, deep X ray therapy in 206, and used radium in eight.

A preliminary examination under an anæsthetic, and a diagnostic dilatation and curettage may be indicated.

1. *Surgical interference* is imperative under the following conditions: (1) a tumour reaching above the umbilicus; (2) pedunculated subperitoneal tumours, or (3) submucous tumours; (4) in the presence of tumours of the ovaries; (5) when degeneration is suspected, either necrobiotic or carcinomatous or sarcomatous; (6) in all cases of doubtful diagnosis.

2. *Deep X ray therapy* is the treatment of election where the tumour is interstitial, the hæmorrhage severe, and the diagnosis clear. The technique varies only slightly from that given above. If the tumour is big, larger fields and a greater focal distance to increase the depth dose are required, to bring about a reduction in the size of the tumour, as well as the cessation of the hæmorrhage.

3. *Radium* is used with success also in a small proportion of such cases if the following contra-indications, in addition to those mentioned in connexion with X ray therapy, are remembered—namely: (1) The presence of submucous or interstitial fibroids which encroach on the endometrium. Here the necrosis caused by the radium may lead to a long intractable uterine discharge, septic absorption, and general ill-health. (2) The presence of a pelvic infection, whether recent or of long standing.

In deep X ray therapy and radium the rays are essentially the same, for in radium we have a natural source, and in X rays an artificial source of Gamma rays. Although radium is invaluable in the treatment of certain types of cancer, especially in cancer of the cervix, X ray therapy is greatly to be preferred in the treatment of fibromyomata of the uterus.

It can produce the same results in this field as radium, whereas the converse does not hold good. In proper hands it is entirely free from danger, whereas radium may produce febrile or inflammatory reactions, and occasionally even suppuration, complications, which are as a rule transitory and not of a serious nature, but which in exceptional cases and in the proportion of 3 per 1000 (Béclère and Regaud) prove fatal. In addition, we must remember that radium therapy is by no means free from discomfort and pain. Its application entails an anæsthetic, confinement to bed, and the presence in the uterine canal of metal tubes for at least 22 hours. X ray treatment, on the other hand, is rapid (40–90 minutes), involves no anæsthetic and no after-treatment. The patient, if she is a worker, need not take special sick leave, unless she is suffering from the effects of the anæmia caused by the menorrhagia. It is sure—the effects are gradual, one or possibly two monthly periods occurring after treatment, the menopausal symptoms (flushes, &c.), coming on slowly, and being less than those occurring at the natural menopause. It is safe—there is no mortality, no resulting endometritis or dyspareunia, no alteration in sexual characteristics. The only disadvantage is the expense of the apparatus and its upkeep, and the skill, knowledge, and care needed in its application.

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Special Articles.

THE DEATHS OF BRITISH MERCHANT SEAMEN IN 1928.

BY FLEET SURGEON W. E. HOME.

THE yearly Board of Trade Return[1] which includes the deaths on vessels registered in the United Kingdom in 1928 (classified they are in accordance with the short list of the Registrar-General with the same modifications as in 1927), tells us that the "first crews" of vessels were, British, in sail, 1600, and in steam and motor vessels, 162,700, making 164,300 British in all, with 18,900 foreigners and 56,500 Lascars, giving a total of 239,700. The Return indicates that this number, the "first crews," furnishes an approximate basis for estimating the variation in the extent of the risks from year to year, though no helpful comment on the variation is put forward. But in the last census of seamen, taken on March 31st, 1926, it was found that the British seamen employed on that day were 81 per cent. of those stated that year among the "first crews," and that the Lascars were 91 per cent. of their figure, the remainder being no doubt on leave or waiting for ships, or unemployed. So, to get a truer idea of the population at risk from day to day, to represent the daily ration strength, it will be better to take these proportions of the "first crews," in round numbers, for British, 133,000, for Lascars, 51,000, and with them to calculate death-rates to indicate if health is improving at sea. The resulting figures though not meticulously correct will at least give us a first significant figure that will be reliable, and the Board of Trade (since 1920) does not even do so much for us as that.

The total British deaths were 861 (6·45 per 1000), of which 403 (3·02) were attributed to disease, 19 (0·14) to alcohol, and 430 (3·20) to violence, of them

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[1] Return of Shipping Casualties and Deaths on Vessels registered in the U.K., as far as reported to the Board of Trade in the year, 1928. London: H.M. Stationery Office. 1929. Pp. 8. 2s.

29 (0·22) to suicide, 379 (2·85) to accidents, almost the same figures as in 1927. The total Lascar deaths were 236 (4·63), of which 168 (3·29) were thought due to disease, none to alcohol, to violence 68 (1·33), of which 16 (0·31) to suicide, 43 (0·84) to accidents, the small decrease chiefly in deaths from disease. About half the British deaths were due to accidents, but only a fifth of those of Lascars. The chief named individual causes of death from disease were, for British seamen, pneumonia, 51 (0·38), an increase, from tubercle of lung, 23 (0·18), a decrease, and enteric fever, 21 (0·16); for Lascars, pneumonia, 42 (0·82), an increase, for tubercle of lung, 23 (0·45), a decrease. It will be noticed that the death-rates for pneumonia and tubercle of lung for Lascars (0·82 and 0·45), who need only have 72 cubic feet of space on their sleeping decks, are roughly double of those (0·39 and 0·18) that occurred among British seamen whose least allowable cubic space is 66 per cent. greater (120 cubic feet). During the last five years (1924–28) deaths from tubercle of lung have been separated in the Return from deaths from tubercle "other," and these having been added together and divided by the five-year totals of "first crews," we find that the death-rate in the five-year period has been, for pneumonia, in the neighbourhood of 0·3 for British, 0·7 for Lascars; for tubercle of lung, British, 0·16, Lascars, 0·7 per 1000, the Lascars having a pneumonia rate twice and a phthisis rate four times that of the British. The true death-rates were really larger, but not materially different. It may be worth while to look at the change in 30 years; then we have, per 1000, "first crews,"

		1901–02.	*1928.*
Pneumonia	British	0·3	0·3
	Lascar	0·9	0·7
Tubercle (all)	British	0·3	0·2
	Lascar	1·1	0·7

from which it appears that hygiene has done more in 30 years for the Lascar than for the British sailor, and more against tubercle than to prevent pneumonia.

It will be observed that the average number of British seamen employed daily, 133,000, is midway between the number employed in the Army in 1928, 183,333, and in the Navy in 1927 (latest year available), 93,230. The death-rates are, Army, 2·50; British merchant seamen, 6·45; Navy, 2·15, and by violence, causes other than disease or alcohol, Army, 0·89; British merchant seamen, 3·29; Navy, 0·77. Merchant seamen being older have a higher death-rate of course. So far as can be calculated, the middle or average age is, in the Army, 24; in the Navy, 25½; in the British merchant service, 30 (the highest group in the Army statement is "40 years and over," in the Navy, "45 and over," in the census of seamen, "50 and over." Why, by the way, do not they all state their ages in the five-year periods of the Registrar-General? What is the practical use of the grouping of the census of seamen "under 18," "18–24," "35–49," except to hinder research?); still when every allowance is made the death-rates of the British merchant seamen do seem excessive, as indeed was said in the Registrar-General's last Decennial Supplement, Appendix B.

The Return tells of the deaths of 403 seamen from disease, of 379 from accidents. The Board of Trade makes no attempt to discuss or explain these facts, and indeed it has no staff for that purpose, but it assures us that if need should arise it will ask the Ministry of Health what to do. Does it not seem to professional, indeed to intelligent lay, opinion that it would be an advantage if the Board, having received the reports of deaths of seamen, at once sent them on to the Ministry, whose expert staff would more quickly realise any need for special attention or action than would the exceptionally intelligent but professionally uninstructed staff of the Board of Trade? Such action has been from time to time invited by the Royal Sanitary Institute, and by others, but nothing seems to happen, and death-rates do not fall as they should.

It will be noticed that, in 1928, 379 British seamen died from accidents. Of these and of the efforts the Board doubtless made for their prevention in future, no mention is made in the Return or elsewhere that I can find. How differently another department manifests its concern in such cases. In 1928 in the factories and workshops of Great Britain there occurred 953 fatal accidents, about which, and the others associated, the Home Office, which has a medical staff, published a book (Cmd. 3360 of 1929) of 150 pages, one page for every six fatal accidents, with statements of contributory causes, prevention, fines, and so on; there were three and a half pages relating to the 100 fatal accidents in docks, as far as dockers were concerned, and 25 pages were included of medical comment by the Senior Medical Inspector, on reading which one feels inclined to ask, With their scanty facilities for washing before meals, are there no seamen suffering from lead poisoning from painting at sea? They are found with difficulty ashore. Are they ever looked for afloat?

In fact, when one remembers that the seamen are in the care of the Board of Trade that cannot tell us their death-rate from year to year, that evidences no intensive care of their accidents or extension to them of the care given to most other workmen, one thinks a little bitterly that this is probably because the seamen, being mostly abroad on any one day, can rarely vote. Is the medical profession satisfied that the health of the seamen is properly safeguarded? Does the seaman get a square deal?

THE LOWER END OF THE ŒSOPHAGUS.

DR. MOSHER'S SEMON LECTURE.

THE Semon Lecture of London University for 1929 was delivered on Dec. 5th, in the Barnes Hall, by Dr. Harris P. Mosher, Professor of Laryngology at Harvard University, the chair being taken by Dr. Dan McKenzie, President of the Laryngological Section of the Royal Society of Medicine. He took as his subject the lower end of the œsophagus at birth and in the adult. The following is an abstract of Dr. Mosher's remarks, which will appear in full later in the *Journal of Laryngology and Otology*.

Anatomical Relations.

The lower end of the œsophagus is occasionally narrowed by the pressure of liver or spleen, either of which may almost close the lumen. At birth there is a long liver-tunnel and often a spindle-shaped dilatation in the lower third bounded above and below by the lungs and liver respectively. A circular narrowing as the œsophagus passes through the crura is very common and is usually accompanied by a sharp spur, which becomes a definite ring-like fold when the stomach turns sharply upwards. The most striking abnormality at birth is a marked narrowing of the cardia. All adult abnormalities, including pouch, may be found at birth. The œsophagus is surrounded by very extensive connective tissue sheath, thicker on the left side and continuous with the lesser omentum and the suspensory ligament of the stomach. These connect it up with the liver and spleen, making possible points of infection. The thickening on the left side may at times be a definite falciform ligament surrounding the left half of the crural opening; this plays an important part in the crural impression found in cardiospasm. One baby showed extensive enlargement of the glands at the bifurcation of the trachea, forming a sheath of glands down to the diaphragm.

A frozen vertical section of a baby at birth shows clearly that the œsophagus comes to a point where it meets the upper edge of the left crus, its angle changing here from transverse to anteroposterior. The terminal portion, the crural arm, is a thin antero-posterior ribbon covered by the left crus. This section explains the appearance seen in X ray films. If there is peristalsis, the fluoroscopic picture of a œsophagus swallowing barium milk looks like a string of stubby, badly formed sausages. In cases of cardiospasm the barium accumulates in the lower end in a thin awl-like point and a small stream trickles into the stomach when the diaphragm ascends. If the patient takes a deep breath, about half an inch of the pointed end of the œsophagus is suddenly cut off. This is due to the closure of the upper part of the crural angle. The form of the sling made by the crura and the amount of support it gives to the œsophagus varies greatly. Normally the two crura come together sharply before they overlap, but sometimes the angle is wide and little support is afforded. In a dilated, sagging œsophagus the wide crural sling may have a clothes-line effect, and bring about the backward bend which is such an important factor in obstruction.

There is a slight and constant thickening of the œsophageal muscles on the left side at the lower end. A cardiac sphincter is often present and consists of a crescentic enlargement of the terminal muscle-fibres. There is a pronounced thickening of the muscular coat where the gastric mucosa begins. The injection of a baby's stomach with wax explained the horizontal fold often seen beneath a gas bubble in the X ray of cardiospasm. It is due to the transverse colon.

Microscopical Findings at Birth.

The connective tissue in the cone of the diaphragm is like a pile of brushwood waiting for the match of infection, and the œsophagus may be infected before birth. This infection plays the major part in cardiospasm. One baby showed the stomach glued to the left side of the œsophagus by dense adhesions, an invagination of the lower end of the œsophagus into the stomach, a great thickening of the crural fold, and an ulcer of the lower end of the œsophagus. An incipient fibrosis was revealed by a great increase of the submucosa and a marked thickening of the circular muscle bundle at the point where the stomach mucosa joined that of the œsophagus. There are two sets of glands in the œsophagus, an upper set between the cricoid and the bifurcation of the trachea and a lower set at the lower end. The upper set are often found in clusters of some size, and these patches are very liable to ulceration. In the last half inch of the œsophageal mucosa there is often a bluish, ring-like band which contains many glands.

Occasionally an œsophagus shows marked segments at the lower end, a structural weakness which adds to the mechanical difficulties of this part and may be a cause of pouching. I believe that ulcer at the lower end of the œsophagus is more common than is realised and is often the cause of spasm. Old ulcers are revealed in the X ray by rib-like projections. A scorbutic guinea-pig may show almost complete occlusion of the œsophagus from hyaline material; the possible effect of vitamin deficiency on the œsophagus stirs the imagination. The involvement of Auerbach's plexus in cardiospasm is secondary and late and accounts for the rare appearance of peristalsis. The plexus is very resistant to acute infection.

The Barium-striped Bag.

Extraordinarily little pressure is needed to overcome the crura in cardiospasm; two pounds will do it and three or four pounds will dilate the crural crease. Spasm is the natural reaction of any part of the alimentary tract to irritation. The use of the barium-striped bag has made many points clear. It is a modification of the Sippy bag by the addition of four barium lines, so that the shape that the bag assumes can be seen through the fluoroscope. I also use a flexible finder about four or five inches long with a heavy tip one centimetre in diameter. Only once has a finder of this size failed to pass into the stomach in cardiospasm. Where the ordinary X ray shows a small awl-like point, the striped bag shows either a waist-like narrowing in the cone of the diaphragm or a large annular stricture opposite the crural opening. A Seidlitz powder is useful for making a gas bubble in the stomach. As a routine I begin by giving the patient a few mouthsful of barium milk to find the fluid level and then give the powder, upon which the barium passes into the stomach—unless the constriction is very tight—leaving the œsophagus relatively clean for the passage of the bag. The findings in cardiospasm are very constant, either a waist-like narrowing of the lower end or two dents opposite each other, the left being larger and blunter. When the patient drinks barium and then takes a forced inspiration there is a much larger impression in the left wall than in the right. This, like the left dent seen with the bag, is the impression of the left crus. The smaller sharper dents, giving the impression of a string-like stricture, are produced by a fibrosis of the fascial covering of the edge of the crura together with connective tissue changes in the œsophageal wall. Adhesions of the diaphragm to the basal pleura are common in cardiospasm and always on the left side; they show up as saw-tooth projections from the upper surface of the diaphragm and indicate a previous chest infection as the cause of the cardiospasm. Pains suggest ulcer or spasm, or both. Ptosis of the diaphragm and the stomach are so common as to be of little importance but may play a part in cardiospasm, as the crural opening falls with the diaphragm. The crural crease in the œsophagus may be found in these cases above the dome of the diaphragm, since it is a more or less fibrotic change in the wall of the œsophagus. Fibrosis of the crural ring, due to low thoracic or high abdominal infection, is the great cause of cardiospasm. Associated with it in old cases there is a backward bend and fibrosis of the terminal portion and a degeneration of Auerbach's plexus. As a result of such infection, transferred from adjacent glands, the œsophagus at or before birth may show a localised or generalised hypertrophy, ulceration, and adhesion.

MEDICINE AND THE LAW.

Manipulative Treatment and Pleurisy.

AT a Liverpool inquest, held at the end of last month upon the death of Mrs. Webster-Jones of Mossley Hill, it appeared that the husband had been unaware of his wife's illness until a few days before her death. Prof. J. McFall of Liverpool University, who conducted a post-mortem examination, considered that the deceased had been suffering from pleurisy for about a month and that there were indications of there having been peritonitis for over a week. Less than a week before death occurred Mr. Patrick Saul, an osteopath of Wavertree, was called in. He stated at the inquest that he held the diploma of the British School of Osteopathy, London. He had found Mrs. Webster-Jones suffering from a septic throat; complications set in and he recognised pleurisy. The coroner, Mr. G. Cecil Mort, asked Mr. Saul how far the manipulative treatment which he practised extended; what limits to it were there, if any? Mr. Saul replied that according to the ruling of osteopathic schools of thought in America there were no limits to the treatment. Prof. McFall in his evidence said there was no doubt, from his point of view, that the deceased's condition had been quite neglected. The coroner thereupon asked him whether, in spite of the neglect, there was anything done to his knowledge which in any way hastened the death. The witness replied in the negative. The husband had previously stated that both he and his wife were perfectly satisfied with Mr. Saul's treatment.

A verdict of death from natural causes was returned. "In this country," said Mr. Mort in the course of his summing-up, "the registration of medical men is adopted for the protection of the public; as long as that is recognised, the responsibility rests with the public as to whom they go to for medical advice."

Fresh Inquest Ordered: Coroner and Witnesses.

Expressly disclaiming any reflection upon the coroner, the High Court on Feb. 11th quashed two inquisitions of Dr. J. Divine, coroner for Kingston-upon-Hull, and ordered new inquests to be held before the coroner for the adjoining Howdenshire division. The judges composing the Court announced that they would take time to consider their judgment upon certain points raised by the proceedings, but, as time was of importance, they announced their decision as to the new inquests forthwith.

Two inquests had been held last December upon the deaths of men named Rispin and Boddy from injuries received when their motor-lorry came into collision with a motor-car driven by Mr. George Walton of Hessle. Each inquest resulted in a verdict of manslaughter against Mr. Walton, who thereupon moved to have the proceedings quashed on the ground of alleged irregularities. The irregularities were set out as follows: (1) that the coroner viewed and discussed a damaged vehicle with a man who subsequently acted as foreman of the jury; (2) that the coroner joined the jury in their inspection and discussion of the damaged vehicle without allowing any other parties to be present; (3) that the coroner failed to direct the jury as to the meaning of manslaughter or as to the degree of negligence required to support such a charge; and (4) that the coroner failed to read over his notes to the witnesses before they signed them. Apart from these possible grounds for reopening the proceedings there was a statement that two fresh witnesses were available, one of them being apparently prepared to say that Mr. Walton was not driving at an excessive speed, the other to say that the brakes of the lorry were not in proper working order before the collision. Dr. Divine dealt in an affidavit with the alleged irregularities. He admitted that he viewed the vehicles with a man who was afterwards a juror, but he denied that any discussion took place either then or when the jury viewed them. He said he had invited the interested parties to be present. He claimed that he had carefully directed the jury and he said that he had read over Mrs. Walton's deposition before she signed it, though he had not read over the depositions of other witnesses, as their evidence was clear, and such reading over was, in his opinion, unnecessary. Finally, while contesting the allegations of irregularity, Dr. Divine explained that he was quite willing to hold a fresh inquest if the Court deemed the evidence of the two new witnesses to be material.

It will be recalled that Section 19 of the Coroners (Amendment) Act, 1926, made it clear that the discovery of new evidence will justify the quashing of an inquisition and the holding of a fresh inquest if necessary or desirable in the interests of justice. The significance of this Section lies in the fact that the coroner himself can now apply for a fresh inquest on this ground, whereas formerly the High Court seldom granted a fresh inquest (under Section 6 of the 1887 Act) unless the coroner had in some way been found at fault. Further comment on the High Court's recent decision is reserved until the Court has delivered its considered judgment. Consisting of Mr. Justice Talbot, Mr. Justice Charles, and Mr. Justice Humphreys, the Court is a remarkably strong one for the purpose, and it may be that the judgment will throw valuable light on the coroner's duty to read over evidence to witnesses, and on the extent to which he may properly be present amongst his jury in the absence of parties whose conduct the jury's verdict may impugn.

A "Sun Room" at Southport.—The Earl of Crawford and Balcarres last week opened a "Sun Room" which has been added to Southport Convalescent Hospital at a cost of over £4000. It takes the form of a large winter garden or palm court, roofed and windowed with vita glass, and will hold 100 patients.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

HUNTERIAN FESTIVAL.

Following the Hunterian Oration (reported fully in another part of this issue) on the afternoon of Feb. 14th, the President and Council of the College entertained at dinner in the Library of the College a distinguished gathering which included Mr. Arthur Greenwood (Minister of Health), Viscount Knutsford, Lord Atkin, the Dean of Westminster, Sir John Anderson, Mr. Justice Hawke, Sir Bannister Fletcher (President of the Royal Institute of British Architects), Sir Arthur Robinson (First Secretary of the Ministry of Health), Mr. Nathaniel Micklem (Treasurer of Lincoln's Inn), Sir David Murray (Prime Warden of the Fishmongers' Company), the Masters of the Drapers', Skinners', Haberdashers' and Apothecaries' Companies, Sir Walter Fletcher, Sir Farquhar Buzzard, Sir Humphry Rolleston, Surg-Vice-Admiral A. Gaskell, Air Vice-Marshal D. Munro, Sir P. Chalmers Mitchell, and Sir Frederic Hallett. The following Members of the Council of the College were also present:—

Mr. C. H. Fagge and Mr. V. Warren Low (Vice-Presidents), Sir Holburt Waring, Sir John Lynn-Thomas, Mr. Ernest W. Hey Groves, Sir Cuthbert Wallace, Mr. F. J. Steward, Mr. R. P. Rowlands, Mr. J. Herbert Fisher, Mr. W. Sampson Handley, Sir Percy Sargent, Mr. G. E. Gask, Mr. W. McAdam Eccles, Mr. Wilfred Trotter, Mr. A. H. Burgess, Mr. Victor Bonney, Mr. G. Grey Turner, Mr. Hugh Lett, Mr. R. G. Hogarth, Mr. R. E. Kelly, and Mr. Graham Simpson, with Sir D'Arcy Power (Honorary Librarian) and Mr. S. Forrest Cowell (Secretary).

Lord Moynihan who presided, in bidding the guests welcome on that evening for their social and academic distinction, offered them the permanent hospitality of the Museum below, should they attain equal distinction in a pathological sense—the gift of true immortality, he called it. He alluded in a few but weighty words to the outstanding need of a centre in London for post-graduate teaching and to the great opportunities for public medicine which were inherent in the provisions of the Local Government Act. Mr. Greenwood, in replying for the guests, said he shared the desire to see such a post-graduate centre an accomplished fact at an early date. London, he remarked, ought to be the greatest home of post-graduate research. Lord Atkin, who admitted frankly as a lawyer "we lag behind you at certain stages," contended with equal frankness that this lag had been unquestionably good for humanity. He laid stress on the importance of medico-legal subjects and put in a plea for a post-graduate institute of medico-legal knowledge. Prof. Thomas Loveday, Vice-Chancellor of Bristol University, in proposing "The Hunterian Orator," spoke of Prof. Groves as a true son of the West country, with distinction both as surgeon and teacher. After dinner the guests scattered to other parts of the College, many of them to the Hunterian Museum which had just been described by the President as the greatest monument ever erected to the honour of a man by himself in his own lifetime.

A New Durham County Hospital.—The Durham County Council and its Public Assistance Committee have decided to build a large central hospital for medical and surgical cases.

St. Bartholomew's Hospital "Lighthouse."—The beacon light which has been placed on the roof of St. Bartholomew's Hospital to call attention to its appeal for a million of money for rebuilding and re-equipment, has been raised 30 feet higher, that its beams may be seen at a greater distance. It has been arranged that very shortly the hospital shall be open free, by ticket, to the public on five occasions for the entire 24 hours. On March 11th and succeeding evenings "The Acts of Rahere," a play illustrative of the life of the founder of the hospital, will be performed in the church of St. Bartholomew the Great.

Correspondence.

"Audi alteram partem."

THE CASE AGAINST THE WIDAL TEST.

To the Editor of THE LANCET.

SIR,—Will you kindly allow me to make some remarks on your leading article under this heading of Feb. 1st? First, I feel that the statement, which you quote, that "the whole enteric group can be differentiated in one dilution without titration of the serums," may have unfortunate effects. May I point out to your readers that the majority of experts do not agree with the statement quoted? For myself, while I admit that the enteric fevers can *usually* (under present conditions) be identified in a single dilution, I hold that in an important minority of cases the additional information gained by titration is indispensable. A good deal more evidence must, in my opinion, be produced in its support before pathologists will be justified in taking what might be termed a retrograde step. The single-dilution method of agglutination, though commonly practised in the infancy of the Widal test, was discarded in favour of a completer titration when experience had been gained of the limitations and pitfalls of the simpler method. In the same way the living culture, a risky and unreliable weapon in all but highly experienced hands, gave way to sterile and standardised suspensions of well-tested properties. Now it is the advent of the "O" type of test that has given the impetus to this movement. "Qualitative receptor analysis" (I do not like either "receptor" or "analysis"), as you have explained, means simply the addition of the "O" test, and the abandonment of the quantitative method.

The new school holds that since the serum of inoculated persons contains no "O" agglutinins, the mere detection of "O" agglutination is diagnostic of infection. This is but a partial truth. Actually the present type of inoculation normally gives rise to titres of "O" agglutination running up to 1 in 200 or 1 in 500 (I have seen traces at 1 in 1000 soon after the second dose), which do not take long to sink below the level (about 1 in 100) of the single dilution recommended for the qualitative test. Thus the residual titre seldom, if ever, interferes with diagnosis in persons whose inoculation is not very recent. But how long will present conditions continue? I have little doubt that in the near future vaccines will be so prepared as to induce as high and permanent an "O" titre as is at present induced for "H." In that case the whole basis of the "qualitative receptor analysis" will crumble, and we shall again be left, as we were in 1914, with serial quantitative measurements as our sole means of establishing a diagnosis in inoculated persons. It is, however, alleged that this latter system is completely vitiated by the "anamnestic reaction," which means that infections other than enteric can cause large rises of the residual titre due to inoculation, and that diagnosis is therefore impossible. Now I submit, Sir, that the importance of the "anamnestic reaction" is very uncertain. True, it has been proved that large rises *can* occur. But there is no evidence that they do so often; indeed, it has definitely been shown that they are rare. This, then, though an important occasional limitation of the method of serial titrations, does not by any means destroy its utility. A high degree of probability in a positive serological result is very useful, even if it contains an element of uncertainty. On the negative side, the value of the method remains undiminished. It is true that serial titrations of "H" agglutinins often fail to distinguish between typhoid and paratyphoid B in triple inoculated persons. But a diagnosis of enteric group infection is of great value. No more than this, indeed, is claimed for "qualitative receptor analysis," when applied to the inoculated.

Quite apart from serial titrations, to deprive oneself of the power of distinguishing between a serum of titre 1 in 100 and another of 1 in 5000 is to limit one's power of diagnosis. For instance, high "H" titres are caused by the specific infection in persons inoculated so long ago that their residual titre has inevitably fallen to quite a low figure—a valuable diagnostic point.

There are other uses for titration. We may find no "H" or "O" agglutination at 1 in 25 at our first test of an uninoculated person, but four or five days later a complete reaction with one or the other suspension at 1 in 50. These two tests together are sufficient for a diagnosis, assuming that standardised suspensions are used. Suppose we had only tried a single 1 in 100 dilution on both occasions? A review of my own records shows me not a few cases in which I should have missed a low-titre provisional diagnosis (subsequently confirmed) if I had not put up 1 in 25 and 1 in 50 dilutions.

Perhaps some laboratories are really unable to cope with the full titration of many suspensions. If so, and if more labour is unobtainable, there are ways of saving time without loss of efficiency. For instance, in some circumstances two or three suspensions may be mixed together. If the result is negative, much labour is saved. Again, a partial titration can be done with two dilutions, as I have recently suggested. This corrects some, though not all of the weaknesses of the single-dilution method. In negative cases time is saved, while positives can, if desired, be further titrated.

I will conclude with two minor points of the many that I should like to discuss. I do not believe that the strain *B. typhosus* 901 is at all unique. There is no difficulty in finding any number of typhoid strains that make excellent "O" suspensions. It is true that the only existing (so far as I know) stable pure "O" culture was obtained by Dr. Felix by accident from that strain—but we shall doubtless get others. Finally, your article suggests (accidentally, I think) that the diagnosis in the case published by Hobson, Stenhouse, and myself in your issue of Jan. 25th was made with a living suspension, whereas it was made with a formolised broth standardised suspension of the "O" strain just mentioned, and checked with an alcohol-treated suspension of the same bacillus.

I hope, Sir, that I have said enough to convey a warning against a hasty and uncritical abandonment of the quantitative method. Every bacteriologist who is in doubt will be able to form his own opinion on the matter if he will continue to titrate, use "O" suspensions (*B. typhosus*), in addition to the usual "H," and see whether, in an adequate series of cases, any one of his dilutions would have given all the results obtainable by titration. I should like to add that the Standards Laboratory at Oxford is about to issue a completely modernised leaflet of Directions for diagnostic agglutination tests.

I am, Sir, yours faithfully,

Oxford, Feb. 13th, 1930. A. D. GARDNER.

THE MEMBERS AND THE COUNCIL OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

To the Editor of THE LANCET.

SIR,—Following the encouragement which those of us who are responsible for a direct move to obtain representation upon the Council of the Members of the Royal College of Surgeons of England have recently met with, we have received promises that should enable us soon to invite from the Members themselves a material expression of their adherence.

On Friday last Prof. Hey Groves, in the Hunterian Oration, referred in generous and valuable terms to our movement. He pointed out that for over 30 years the governing body of the College had been requested to consider the situation, and alluded to the phase of amity and good temper which at last marks the discussion of the question at the annual meeting of Fellows and Members. But he went on to point out that, unless a substantial number of the 18,000 Members record their view that the reform is desired, the Council of the College may well decline to believe that the modern and democratic aspect need be adopted. "The chief thing," said Prof. Hey Groves, "which is needed to bring this about quickly is convincing evidence that the change is desired by the great body of the Members."

A circularising of the Members will shortly take place, and it is earnestly hoped that replies will be received from a substantial number—why should it not be signed by them all?

As was mentioned in a previous communication, the sum—a very small one when the number of those interested is remembered—of £250 is required to defray the cost of the circular. A certain proportion of this sum has already been received, but our treasurer, Dr. K. Barrett, 102, Church-street, London, S.W.8, will gladly receive and acknowledge further contributions, which are needed.

I am, Sir, yours faithfully,
ERNEST E. WARE.

Welbeck-street, W., Feb. 17th, 1930.

LARYNGEAL PAPILLOMA FOLLOWING GASSING.

To the Editor of THE LANCET.

SIR,—I have been invited to collate papillary granuloma of the larynx, or cases of a similar nature, with a history of exposure to mustard or other irritant gas, for presentation at the summer meeting of the Laryngological Section of the Royal Society of Medicine. The points of note appear to be:—

1. Signs and symptoms, clinical appearances.
2. Date of exposure to gas; nature of latter.
3. Latent period, if any.
4. Operative measures; exact site of granuloma; pathological report.
5. Exclusion of syphilis/tubercle; ? blood or sputum examination.
6. Subsequent history.

I should be very grateful if any of your readers will supply me with notes of cases of this seemingly somewhat rare condition that they have seen. Illustrations, microscopic slides, and (of course) personal presentation of notes at the meeting will be especially welcome. References to published cases, or to occurrence apart from war service, will be valued. Any communication should be addressed to me at the Royal Infirmary, Bristol.

I am, Sir, yours faithfully,
E. WATSON-WILLIAMS.

12, Victoria-square, Clifton, Bristol, Feb. 13th, 1930.

REST IN THE TREATMENT OF GONORRHŒA.

To the Editor of THE LANCET.

SIR,—Dr. Spence's instructive article in your issue of Jan. 4th clearly emphasises the virulency of the gonococcus and the potential mischief of which it is capable. This devastating microbe, of course, invades the male via the meatus, and then enters the anterior urethra, creating intense surface inflammation, but at the same time insinuating itself by division down every microscopic gland of the mucosa. No other microbe is capable of raising such a "bonfire" of inflammation, so that once implanted its presence should, under no circumstances, be deemed of trivial account, lest some of those who have not had occasion intimately to study the habits of this particular microbe should be led into taking a light view of the situation at the only period when one may prevent extension backwards beyond the compressor urethræ.

To accomplish this very desirable result, and even to give a reasonable chance of its being achieved, the patient should be told—just as positively and emphatically as in the case of, say, an acute antrum—that he should go to bed and lie up, and it should be explained to him that without this all-essential element of complete rest, it is quite impossible to hold out the hope of a cure within a reasonable period; still less that he should escape serious complications, even though the newest and most infallible of irrigations be diligently employed. This necessity for rest in bed is even now too little insisted upon, because of the still persisting taboo, disgrace, and secrecy under which all venereal complaints had to be treated in the old days. Nowadays, when thanks to propaganda, leaflets, &c., these same complaints are a subject of ordinary conversation in mixed companies, the onus of refusing to lie up must be put on the unhappy victim of the complaint, and it must be explained to him that his refusal to do so only means that he runs the risk of the many and serious complications which surround the activities of the gonococcus.

By means of real rest, physical and dietetic, half at least of the very serious complications whose treatment is so ably described by Dr. Spence would and could be altogether avoided.

I am, Sir, yours faithfully,
JAMES B. BYLES, M.B. Lond.

St. James's-place, S.W., Jan. 7th, 1930.

Obituary.

JAMIESON BOYD HURRY, M.D. CAMB.

THE name of Dr. J. B. Hurry, who died on Feb. 13th, at the age of 72, has long been familiar to the profession by his books on "vicious circles." He was a man of wide interests, and had a faculty for communicating them to his fellows. The town of Reading, where he practised as a physician, was perhaps the greatest gainer by his enthusiasm and generosity, but as doctor, archæologist, and botanist he formed an important link of many *circuli virtuosi* which spread far beyond his own acquaintance.

DR. J. B. HURRY.

[*Photograph by Elliott & Fry.*

Son of the Rev. Nicholas Hurry, of Liverpool, Jamieson Boyd Hurry was educated successively at Neuchâtel, in Switzerland, the City of London School, St. John's College, Cambridge, and St. Bartholomew's Hospital, London, where he was resident obstetric physician under Matthews Duncan. After qualifying in 1882, he travelled for a year as ship's surgeon, visiting South America, Australia, and India, and thus laid the foundation of an intense love of travel which he was able to gratify in later years by tours in various parts of the world, including North and South America, Egypt, Morocco, and almost every European country. By these means he acquired an interest in continental medical schools, in international social questions, and especially in tropical and economic botany. In 1885 he became partner of the late Mr. George May, of Reading, where a long and active professional life extending over 40 years was spent. During this period he was a keen member of the Reading Pathological Society, and became deeply impressed with the social and professional value of medical societies, in evidence of which he published "A History of the Reading Pathological Society," and afterwards "The Ideals and Organisation of a Medical Society," which has been in wide request by the officers of medical societies at home and abroad. It was not until 1911 that he produced the first of his classical monographs—namely, "Vicious Circles in Disease"—but the idea behind them proved so instructive that it was followed in succession by works on the vicious circle of neurasthenia, sociology, and poverty. The subject aroused keen interest abroad, as was shown by the various foreign translations; the first book appeared in French, Spanish, and Italian, and "Vicious Circles in Poverty" was translated into Chinese. Japanese, French. Spanish, and Italian. These books have undoubtedly done a great deal to draw attention to the importance of the "circular process"—a process which every clinician and every politician must recognise with profit.

At Reading Dr. Hurry became the historian of the Abbey, and took much interest in the preservation of the ruins. During later years he devoted a good deal of time to yet another hobby, economic botany, and established an educational garden at his home at Reading, where were assembled from all parts of the world numerous tropical and economic plants, more especially such as yield food, fibre, dyes, or medicines for the service of man, tender plants being housed in a series of hot-houses. Close by was established a museum in which were exhibited many of the products derived from the plants growing in the garden and conservatories. By this means the plant and its economic product could be studied side by side, and this practical method of studying economic botany attracted large numbers of visitors from far and near. In 1926, owing to impaired health, Dr. Hurry retired from practice and moved with his family to Bournemouth. The collection of tropical and economic plants from Reading was presented to the Corporation of Bournemouth, which has housed them in the King's Park Nurseries at Boscombe. Even in his retirement his pen was never idle, and he published a volume entitled "Imhotep, the Vizier and Physician of King Zoser, and afterwards the Egyptian Deity of Medicine," of which a second enlarged edition appeared in 1928. At the time of his death he was engaged in writing a volume on "Woad," which will shortly be published.

Dr. Hurry married Gertrude, the daughter of Arthur Hill and a niece of Miss Octavia Hill. He leaves a son and a daughter.

ENLARGEMENT OF BECKETT HOSPITAL, BARNSLEY.—Lady Sutherland last week opened a casualty and out-patients' department at this hospital for which the claim is made that it is "the finest in the provinces." The new building, which is of two storeys, and is structurally connected with the hospital, comprises medical and surgical units, dispensary, casualty receiving and dressing rooms, a radiographic unit, massage, ophthalmic, dental, and other departments. The area Miners' Welfare Fund granted £22,000 towards the cost, the Barnsley British Co-operative Society gave £1500 and the X ray apparatus.

HOSPITALS IN EAST AFRICA.—In a debate on Colonial policy in the House of Commons on Dec. 11th, Mr. Marley said that he was informed that there was only one native hospital in the whole of the East African territories. Writing in the *Times* from Nairobi, Dr. James H. Sequeira points out that in Kenya alone there are 18 Government native hospitals with 1371 beds, with 61 dispensaries attached to them, and that five new hospitals will be in commission by the end of the present year. In 1928 21,236 in-patients and 186,545 out-patients were attended in these institutions, and, in addition, 300,000 patients were attended at out stations and by medical officers on tour.

Medical News.

UNIVERSITY OF OXFORD.—On Feb. 15th the following degrees were conferred:—

B.M.—R. S. B. Pearson and J. K. Marshall.

UNIVERSITY OF LONDON.—At a meeting of the Senate on Jan. 29th it was resolved that the subject of the essay or dissertation for the Rogers Prize for 1931 should be Filtrable Viruses as a Cause of Disease in Man.

The University Medal at the M.D. Examination (Branch I, Medicine), December 1929, has been awarded to Cyril Francis Fernando, of University College Hospital.

The Senate will shortly consider applications for grants from the Thomas Smythe Hughes and Beaverbrook medical research fund. Particulars may be had from the Academic Registrar.

The election of Beit Fellows will take place about July 15th, not more than three Fellowships, of £250 per annum, being awarded for scientific research. Information may be had, by letter, from the Rector of the University.

University College.—A course of four lectures on Chemistry of Muscle in Relation to Problems of Cellular Physiology will be given at the College by Prof. Otto Meyerhof, of Heidelberg, at 5.15 P.M., on March 6th, 7th, 10th, and 12th. Prof. A. V. Hill, F.R.S., will take the chair at the first lecture.

MEDICO-LEGAL SOCIETY.—A joint discussion with the West London Medico-Chirurgical Society will be held at 11, Chandos-street, Cavendish-square, W., at 8.30 P.M., on Friday, March 7th. Lord Riddell, President of the Medico-Legal Society, will open a discussion on the Doctor in the Law Courts, and among the speakers will be Sir William Willcox and Dr. F. Temple Grey.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL. Prof. E. B. Verney will deliver the Eighth Biennial Sydney Ringer memorial lecture at this School on Monday, March 17th, at 5 P.M. His subject will be the Reserve Forces of the Kidney.

UNIVERSITY COLLEGE HOSPITAL.—At 3.30 P.M. on Wednesday, March 10th, Prince George will open the new Preliminary Training School for Nurses, which has been presented by the Rockefeller Foundation.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A meeting of the Council was held on Feb. 13th, with Lord Moynihan, the President, in the chair.

The Honorary Medal of the College was awarded to Prof. Grafton Elliot Smith, F.R.S., in appreciation of his services to the Museum.—Mr. Victor Bonney was re-elected the representative of the College on the Central Midwives Board, and Mr. R. E. Kelly was re-elected a Member of the Court of the University of Liverpool.—Mr. J. Herbert Fisher was appointed Bradshaw Lecturer for the ensuing year.—It was reported that Sir Arthur Keith's Hunterian Lectures would be given on May 5th, 7th, 9th, 12th, 14th, and 16th.

The Fellowship of the College was conferred on Mr. G. C. Dorling, of London Hospital, and the Membership on 135 of the candidates whose names were given in our issue of Feb. 8th (p. 326) as recipients of the L.R.C.P., excepting Rosa E. Chamings, B. S. Cornell, A. N. Duggal, A. H. Gurney, E. Marks, H. P. Nelson, and Alison J. Rae. It was also conferred on C. C. Bryson, Cambridge and Middlesex, and S. Scher, Cape Town and University College.

Diplomas in Public Health were granted jointly with the Royal College of Physicians to the 41 candidates whose names were given on Feb. 8th.

It was announced that the Evening Reception at the College in connexion with the Jubilee celebrations of the Ophthalmological Society of the United Kingdom would be held on April 3rd.

It was reported that Mackenzie Mackinnon Research Fellowships had been awarded to Dr. Thomas Cecil Hunt for research on duodenal catheterisation, and to Dr. George Scott Williamson for research on the study of diseases of thyroid, thymus and lymphatic tissues.

The President stated that an election of three Fellows into the Council would take place on Thursday, July 3rd, at 11 A.M., in the vacancies occasioned by the retirement in rotation of Mr. R. P. Rowlands, Sir Percy Sargent, and Mr. Victor Bonney; that notice of the election would be given to the Fellows by advertisement and by circular on March 7th; that March 17th would be the last day for the nomination of candidates; and that a voting paper would be sent on April 1st to every Fellow of the College whose address is registered at the College.

laid down that a patient must be discharged in any case within 28 days of recovery of volition. What they had tried sincerely to do was to protect the individual and at the same time not to introduce the process that was commonly associated with entering into a mental institution. He believed that this clause would mark a great advance in the treatment of incipient mental disorder, but he was equally sure that the intervention of the magistrate in these cases would destroy the whole value of the clause. If they condemned these people to certification they would not get the early treatment that was desired, and one of the main purposes of the Bill would have been defeated. A large body of public opinion was prepared to support this measure and get rid of what had been called the stigma of judicial interference. He might claim that in this matter they had the vast majority of the medical profession behind them. Lord Dawson had spoken warmly in support of the Bill. It was significant that when, in the House of Lords, an effort was made to introduce intervention of the magistrates, two of the law lords opposed that view and supported the Bill. Other clauses dealt with provisions regarding local authorities. Their powers and duties were enlarged and they were enabled to do more in the way of facilities for treatment. They were also given power to provide out-patients clinics, to undertake after-care, and to undertake research. These powers were subject to the approval of the Board of Control and were so drawn on the specific recommendation of the Royal Commission. Objection had been taken to making this a new duty, but it was not so much a new duty as the application of an old duty in a different way. If they modified the law with regard to local authorities, they ought to modify the law with regard to the central authority, and the whole point of the reorganisation clauses was to re-establish the Board of Control on a new basis, with a closer contact with the local authorities and with the procedure and method of administration assimilated to that which was followed now in the Ministry of Health itself. The whole desire behind these proposed alterations in the Board of Control was to adapt that central machinery to the rapidly developing work within the sphere of the Board. It had been stated that the Board of Control was a Star Chamber which was not within the jurisdiction of the House, but nothing could be more untrue. Parliament would have the final say in the matter of the detailed administrative rules. The Royal Commission desired a complete overhaul of the lunacy administration. That had not been possible, but it had been possible to dissociate people suffering from mental disease from the poor-law.

The Practitioner's Peril.

The remaining clauses of the Bill dealt with one or two matters of importance. Clause 16 referred to the protection of medical practitioners who gave certificates under the Lunacy Acts. The position of the medical practitioner to-day was one of considerable uncertainty, indeed many of them thought it one of very real peril. The Royal Commission recognised it. To-day, if the medical practitioner was made defendant in a case for wrongful certification, the onus of proof rested upon him to show that he had acted in good faith and with reasonable care. He (Mr. **GREENWOOD**) thought it was clear that they could not completely remove responsibility from the medical man. After all, he had made a decision and, therefore, while they must keep upon him a certain measure of responsibility, it was important on the other hand that he should have reasonable protection against cases which might be brought, and which might mean his financial or professional ruin, even if the cases did not go against him. The clause in the Bill followed very closely the proposal made in the Royal Commission's report which was drafted in detail by the very eminent legal members of the Commission. As regarded the proposals of the Royal Commission about the assimilation of procedure, he thought it would have been admirable if it could have been done. But he was not sure that it could have been done very simply. On the other hand he was quite clear that it would make the Bill highly controversial, and his aim was to get a minimum of controversy in regard to the measure. It would also, perhaps, have been advisable to follow the report of the Royal Commission in regard to the licensed houses, but that too was a burning of the full of deep-seated differences of opinion. These matters, therefore, had been deliberately excluded from a Bill which was designed to meet an urgent need and to revolutionise the public mind in its attitude towards mental disease, and to provide early treatment for that disease. It was also designed to reorganise the administrative machinery so as to make the constructive proposals more nearly operative and more successful. He thought that the House would not find in the Bill any cause for blind difference of opinion. He hoped that the second reading would be carried so that it could go to a Standing Committee. In committee, every effort would be made to accept amendments which would really improve the measure, provided that they did not interfere with the principles on which it was based.

A Saner View of Insanity.

Sir **KINGSLEY WOOD** said that he welcomed the main provisions of the measure because he thought it represented a saner view of insanity. Provided that opportunities were given for the discussion of certain points, the Opposition hoped to be able to coöperate with the Government in the passage of the Bill. Speaking subject to what might be said by the medical Members of the House, he thought it might be said that mental illness was not being reduced in this country. The recovery-rate was not a particularly good one. There was an increasing number of persons suffering from temporary mental troubles due to the increasing speed and strain of life. He was glad to think that in many respects the old conceptions and unhappy methods concerning mental illness were disappearing, but they died hard. They were still in many respects manufacturing lunatics; the old idea of the hopelessness and helplessness of mental disease still prevailed in many quarters. There was still the stigma of lunacy harking back, no doubt, to the time when madmen were kept in chains and underground cellars. He thought that there were two grave defects in the present system. The first was that the present law undoubtedly placed many obstacles in the way of early diagnosis and early treatment; and secondly under present circumstances and the present law there was very little hope of recovery for many poor people in this country. The poorer patient must have reached the final stage before a mental hospital could receive him. He welcomed the proposals in the Bill with regard to what was called the voluntary boarder. He suggested that it might be possible to remove this class of patient altogether from the jurisdiction of the Board of Control, and by that means dissociate this kind of illness from lunacy. That might very well be discussed in committee. A good deal of importance was attached by eminent lawyers in the House of Lords to the fact that inasmuch as minors could be detained in homes of that character for a certain period at the request of parents, the Board of Control would cause the homes to be visited by commissioners, as some measure of protection. How far that protection was substantial could no doubt be considered when the Bill was in committee.

In Clause 5 provision was made for treatment without certification of persons "temporarily incapable of volition." That was a matter which ought to be carefully considered, to see whether every protection was afforded. For the first time an order was to be signed without what was called a judicial authority. If it were possible, subject to proper safeguards, to avoid certification, it ought to be done. Certification as a lunatic raised real apprehension and dread in the minds of large numbers: once a person has been so certified, even if he or she recovered, it followed them for the rest of their lives. He doubted, however, whether, from the point of view of the liberty of the subject, the intervention of a Justice of the Peace was any protection. The Justice of the Peace who did his duty seriously in that connexion would be in a most difficult position if he were confronted with certificates signed by competent medical men. If regard were had to the reports of the last two tribunals which have been set up by the House to consider the treatment of lunacy, cases of wrongful detention must be of the rarest occurrence, and ill-usage was not deliberately or systematically practised in the institutions. He placed a great deal of confidence in the Board of Control and its operations, and the fact that members of the Board could visit those institutions at any time was a considerable safeguard. He hoped that one result of the measure would be that the superintendents of those institutions would have more time to attend to their proper job and would be relieved of many duties which did not apply properly to them.

The provisions of the Bill which called for further consideration were those relating to the medical profession of the local authorities. He had a good deal of sympathy with the plea of many medical men that some further protection should be afforded them in the discharge of their duties under the Bill than its provisions provided. Additional responsibilities were placed on local authorities, and he had been asked by the London County Council to put forward on their behalf and on behalf of other local authorities, a claim for further financial assistance. The Bill was on the right lines, and the Opposition would be happy to assist in its passage.

"Voluntary Patients."

Dr. **MORRIS-JONES** said that 20 years' experience as a medical practitioner had convinced him more and more that there was a very urgent need for such a measure as this Bill. Mental disease in recent years had become more and more allied to physical disease, and after all the line of demarcation between the two was very thin. He welcomed Clauses 1 to 4 dealing with voluntary boarders. He would prefer the term "voluntary patients." He also welcomed Clause 5 which dealt with persons incapable of volition. It was, in his opinion, the crux of the measure and had been considerably improved during the passage of the Bill through the House of Lords. It was reassuring to be told by the Minister of Health that he would be responsible for the Board of Control on all occasions. He would like to see a little more protection for the medical profession than that given in Clause 16.

Dr. **ETHEL BENTHAM** said she heartily welcomed this Bill which was a step in the beginning of a reform which had been overdue for many years. She had had 13 years' experience as a general practitioner, and had acted as a magistrate ever since women magistrates were first appointed, so that she had had considerable knowledge of this question. When in the interests of a patient she had had to go to the Board of Control she had found it human—when one could get at it. The mental patient needed to be protected, first of all against himself, and in many instances against his relatives; in her experience the relatives were the people from whom he most often needed to be protected. If it was laid down that in every case, pauper or otherwise, two medical opinions had to be obtained, then in her opinion a certificate of a justice of the peace was not much needed. The non-medical justice was at such a disadvantage in face of medical certificates that it was really better to have the opinion of two medical men. The re-christening of the Board of Control would be quite useful, but some steps must be taken to give an appeal to the Board and to bring about greater public confidence in that body. She thought that the number of three members was too limited. It would be necessary to have two doctors—one a man and the other a woman—on the Board, and she thought the membership should be enlarged to five.

A Supervisory Authority.

Dr. **SOMERVILLE HASTINGS** said that all who were interested in the early treatment of mental disease would welcome the Bill. There might be two opinions as to the exact status of the Board of Control, but such matters might very well be dealt with during the committee stage of the Bill. He would like to add to the list of the Board's functions a supervisory function in connexion with the treatment of cases suffering from mental disease. That function was a very right one. It might be necessary to alter the exact status of the Board of Control, but he felt very strongly that some supervisory authority would always be necessary in dealing with mental disease. There were two considerations in connexion with mental disease which required attention. The first was the question of what was best for the patient; what treatment ought to be given, and what could be done to increase the patient's comfort. Another important point was the protection of the public, the protection of the patient from himself, and the protection of the good name of the patient's family. To achieve this latter object some form of detention was necessary. He was associated with a hospital which treated early cases of mental disease, and their difficulty was that they had no power of detention at all. Therefore, their selection of cases was strictly limited, and they could not forcibly detain patients even when it was in their own interest and when they felt that they ought to be detained. He wished to lay stress more particularly on the possibility of the treatment and cure of mental disease. Not long ago mental disease was thought to be an act of God, but now they were learning more and more that something could be done to alleviate this disease, and sometimes to cure it. He had seen cases of severe insanity treated and cured by ordinary medical treatment, or by a relatively simple operation on the nose. Many of the patients at his hospital suffered from some other medical or surgical ailment that could be recognised when the patients were closely examined by physicians and surgeons accustomed to deal with those other affections and when those other conditions were treated the patients very often rapidly recovered. One great point in favour of this Bill was that it would allow public money to be spent on the treatment of early cases of mental disease which was now impossible.

There was a type of patient not dealt with in the Bill, but about whom it was important to say a word or two—the patient who did not know that he was insane, but thought everybody else was. These were the people whom it was desirable to consider at present. Sometimes they recovered, as had been shown by the Minister of Health, but when they ceased their anti-social behaviour their ego did not change. They did not believe that they were insane before, and when they recovered they did not believe that they had been insane. These were the people who wrote pamphlets and distributed them to Members of Parliament and tried to catch Members of Parliament in the outer lobby of the House. It was these people who tried to impress the public with the evils of asylum treatment and with the sins of the Board of Control. They had to recognise that a great many early cases of mental disease were curable, but it was necessary to have some power of detention in such cases and unless that power was obtained, not very much could be done. He was very interested to hear the Minister of Health say that the stigma of certification was a real thing. There was no question that that was the case, and the stigma of association with the certified was also a real thing. He would like to see further provisions in the Bill for the withdrawal of the voluntary boarders and those not capable of volition, as far as possible from association with the certified, and for bringing them into closer association with the treatment of ordinary medical and surgical diseases. If a clause could be inserted in the Bill encouraging the local authorities, or even compelling them to do this, it would be a very great help. Although there might be ways in which the Bill could be improved in the Committee, it made a very great advance in providing for the treatment of early mental disease.

The Bill Supported.

Captain **GUNSTON** congratulated the Minister of Health on introducing the Bill, which, he said, he wished had been more far-reaching. They ought to be grateful for the name of the Bill—"The Mental Treatment Bill,"—because it described so exactly what they were trying to do. There was some misconception in the country as to the difference between a mental deficient and a person mentally affected. The Bill did not deal with the mental deficient. Everyone would congratulate the Government on bringing in a measure which would enable the poor to get very early treatment and, in many cases, to be cured.

Mr. **LOGAN**, speaking as one who had had some experience of poor-law administration, supported the Bill. The passing of the old boards of guardians, and the coming of the Public Assistance Committees was bringing in a new trend of thought and a new system into the management of the affairs of the nation. The Minister of Health should take into consideration the question of segregation. It was utterly impossible to deal with mental cases, whether certifiable or for temporary treatment, unless they were segregated. Without segregation, classification would be useless. Both were absolutely essential. Provision should also be made for classification of cases of senile decay, in addition to classification of temporary cases which were not chronic.

Mr. **R. RUSSELL**, in supporting the Bill, said that in Committee the whole question of the relationship between the local authorities and the Board of Control would come under very serious consideration, and would need some remodelling. The local authorities had built up these great institutions and had done magnificent work, but they were very much alarmed at the powers which were given to the Board of Control in regard to them. There was no doubt, also, that considerably increased expenditure would be placed upon the local authorities.

Dr. **FORGAN** said that he gladly joined in the chorus of praise of the Bill, though he would have to qualify it to some extent by calling attention to one or two defects. He would like to say what great benefit institutional treatment for voluntary boarders and the possibility of after-care treatment could be. The Bill did not apply to Scotland, for the very good reason that Scotland had its separate Board of Control, and a member of the Royal Commission had stated that the practice in Scotland showed an enormous advance upon that in England. In Scotland, those suffering from mental disorder were treated in a very flexible way, with enormously good results from the point of view of the health of the patient. The percentage of the population certified as insane was almost 20 lower than in England, and the different method of treatment might to some extent be responsible for that. He had had brought to his notice some time ago the case of a young man who had been unemployed for a considerable time, and fear of future unemployment became such an obsession that finally he had to be admitted to a poor-law institution where, after some months of doubt, not as a certified lunatic but as a voluntary boarder, he was restored to normal mental health and discharged. Then he had to face again the very trouble that had driven him into the mental institution—the fear of continued unemployment. It was only necessary to draw the attention of the local authority to the fact that he was up against the thing that had practically made him insane before, for the parish council to provide him with work. By means, first of all, of treatment, and afterwards by after-care, he was saved from what certainly would have been permanent insanity. He commended to the notice of the House the practice in Scotland, which apparently was considerably in advance of that in the South. As regarded the defects in the Bill, temporary patients were, in the opinion of those who had framed the measure, likely to be treated in the existing poor-law institutions, and many members of the public would think there was very little difference between a declaration signed by two doctors and certification, if the patient was then removed to an asylum. That emphasised the paramount importance of setting up other institutions for the treatment of early cases. But the most important defect was the very serious additional financial burdens which would be placed on local authorities. Temporary patients were an entirely new class of patient. Fresh accommodation would be required for them, and fresh expense would be incurred by the authorities and, if the method of allowing non-volitional cases to remain for six months without certification was going to be effective at all, it would mean for some years an increase in the number of persons who would receive treatment and new accommodation would be required if the authorities were to put into effect the permissive powers which the Bill gave them. The Royal Commission declared that the Exchequer contributions to local authorities for work of this sort in the past were wholly inadequate, and they themselves were of opinion that an ad hoc grant was necessary if local authorities were to undertake the new duties. Local authorities were now faced with additional work, with their resources for further rating depleted by the De-Rating Act of the last Government. He was afraid, if this subsection was to remain permissive, that the great majority of the local authorities would be unable financially to undertake any work at all. The Bill, as it stood now, was not going to provide early treatment except for those who were able to pay for it. The history of lunacy reform had been a history of good intentions. In 1881, the Commissioners reported that for 40 years their efforts had been directed towards obtaining early treatment. That was 39 years ago, so that for almost 80 years the Commissioners had been attempting to obtain early treatment. Early treatment was the keynote of this Bill. He hoped that the Bill would have a unanimous second reading, and that at a later stage it would be so amended as to make it really capable of bringing about a praiseworthy reform.

Sir JOHN WITHERS, speaking as one who had had a good deal of experience in lunacy work, said that on the whole the Bill was extremely good. Clauses 1 to 4 were excellent, but he must refer to Clause 5. He had an old-fashioned dislike to doing away with the certificate of the magistrate. That had been, on the whole, a great safeguard. Under this Bill people could be put away in an asylum or home for a whole year without any legal certificate, and his feeling was that that was a mistake. He could see no reason for it. The idea that certification of itself was a stigma was a misconception. From the point of view of the patients themselves, certification was a protection. It protected the patient, the doctors, and the family. The expression "incapable of volition" would also have to be explained, and there ought to be some mode of appeal from the Board of Control.

Non-volitional Cases.

Lieut.-Colonel FREMANTLE said that they were dealing with the distressing cases which numbered already some 135,000 persons in mental institutions. Of these, it was estimated that about one-third were what were called in the Bill non-volitional cases. That was to say, from 40,000 to 50,000 were non-volitional cases. As had been said, the expense and necessity of providing for these people was already met. Therefore the need of new accommodation did not arise in their case, although one naturally hoped that, in time, better accommodation might be provided for them as for others. With regard to the non-volitional cases, one of the objects of the Bill was to lead those who at present were frightened off from certification to submit themselves to treatment, or to be submitted by those responsible for them. Therefore there would be need of further accommodation. It was well for them to recognise that there had been some exaggerated enthusiasm about the Bill as opening a new era. The treatment of the insane had varied with the conception and knowledge of their condition. Although the way of representing insanity of older times had gone out of fashion, he was doubtful whether the modern jargon of psychology which had taken its place gave any more accurate and scientific picture than the old idea that an insane man was possessed by a personal and malign influence. The idea of a man "possessed of a devil" gave way to the idea that an insane person was divinely afflicted and had to be restrained as a danger to society and to himself. The first organic stage in our system for dealing with lunacy might be said to have started with the Elizabethan poor-law and the institutional arrangements which arose at that time. The process of dealing with the insane then was one of mechanical restraint, and that idea continued until King George III., who was himself a sufferer, was treated under humane conditions by Dr. Addington, a physician of that day, and father of the statesman, Lord Sidmouth. He introduced the idea of humane treatment which, applied in such an exalted sphere, naturally attracted attention. Still, the idea of mechanical restraint held sway in the beginning of the last century, until Charles Reade wrote "Hard Cash," and Cockton wrote "Valentine Vox." The indignation aroused was such that finally the lunacy laws were amended. The great Lord Shaftesbury was responsible more than anyone else for the passing of the 1845 Act, known as the Magna Charta of the insane, and he became one of the first Commissioners in Lunacy. He was so much averse from the introduction of the justice into the business of certification of the insane that when, eventually, the Act was passed, he resigned his Commissionership in protest, and stood for the principle which was being introduced in the Bill that day. From that time onwards they had had a conflict or clash between what had been called the static mind of the lawyer on the one hand, and the dynamic force of the biologist on the other—that clash which was described by Prof. Kenny in his "Outline of Criminal Law." It was no disparagement to the legal profession to refer to the static mind of the lawyer, because the law must necessarily deal with concrete and defined facts, and that really created the difficulty in this case.

The Doctor's Viewpoint.

The medical profession had necessarily to look at it from the other side. He spoke, not as one who had practised the profession of curative medicine, but from the administrative point of view, the view of the lay authority and of the interests of the community as a whole, and especially from the point of view of prevention as well as of cure. Therefore he again called attention to the position of the medical man in the case. It had been referred to already so pathetically and intimately by his professional colleagues who had spoken in the debate, but he asked the House to consider the position they were in when called on to deal with a case that was first of all recognised in a family as one of difficulty, of violent temper, of a rather changeable and fickle state of mind, of a person difficult to deal with. Commonly, the person was regarded as not only a nuisance, but as being voluntarily responsible for the trouble in the family and the household. The medical man came in and realised that it was a case where the strain, in one form or another, had been so great as temporarily to derange the mind of the individual. It was a temporary early case, and it would be ridiculous to sign that as a case of certified insanity. It was obvious, from the mere facts of the case, that it arose from the normal incidents of health and ill-health in a life; such cases as arose after childbirth, after fevers, confusional cases, and temporary alcoholic or toxic cases. These were difficult cases that arose and which had to be treated by the medical man, who said "It is absurd that this should be signed up as insane." These were the cases which up and down the land at present were not being certified and never would be certified. Therefore, here was a way in which these people could get the expert care, comfort, and treatment that would enable them to tide over the time until they could again resume their normal place in family and public life. It must invite the sympathy of everybody who understood the case. When the doctor was called in the case might be in a violent temporary state of insanity. What was the doctor to do? He chafed at delay, and the relatives chafed at delay, but as the case was at present the only possibility for these violent cases was to search out a justice of the peace. He spoke as a justice of the peace as well as a medical man, and he knew how difficult it was for individuals to find a justice of the peace when he was required in such a case, or to find one who was able to go into the case. As had been well said already, as a rule the justice of the peace deferred to the medical man's opinion, and said "the medical man says so, and obviously I must sign it up." It was true, as the Royal Commission found, that the safeguard of a justice of the peace having to certify a case was a very small one compared with the safeguards provided in this Bill. They had a man who, it seemed to him, was more qualified to look after the safety of those concerned than a justice of the peace, because he was to be a medical man approved by the Board of Control. In fact the criticism of this proposal made from the medical profession was that it might start a new specialty—a separate and distinct class of practitioners. Be that as it might, he thought that the Board of Control would obviously approve only men who would take public point of view, and who would realise their responsibilities in the matter. He wanted the House to sympathise with the ordinary family doctor and help him to get through these delays and difficulties that were so troublesome and tiresome to the patients and their families. The medical man realised equally well the necessity for protecting the personal liberty of the subject. He did not believe that anybody so much as the medical man would be so acute and keen to discover any kind of ill-treatment and mischief that was going on in a case. Till the end of time there would always be cases where the law would be defeated; no law would be perfect, and those who supported this measure so keenly only asked people to recognise that they had put in a safeguard of a medical man approved by the Board of Control in addition to the family doctor as a more efficient person than the judicial authority. In regard to the Board of Control he (Colonel Fremantle) agreed with many of the criticisms.

It had been suggested that there was a stigma attached to the Board of Control, and that a new body should be formed to deal with these persons. There was no need to have a fresh Board for every class of insane or mentally afflicted persons who were to be treated.

It was in order to get rid of the stigma that the Mental Deficiency Bill of 1913 was passed, and that the Lunacy Commission was absorbed in the Board of Control. Some stigma must attach to any body that undertook these functions, because they were concerned with people who might eventually be certified as insane. They must trust the Board of Control, and in committee they could consider the clauses dealing with the Board in order to secure that the Board would have the confidence of the public as being efficient and expert, and at the same time a sensible body to deal with this subject. But unless they gave a salary and position to the Commissioners greater than those already enjoyed by the class of experts from whom the Commissioners were drawn, they would not get the right class of experts to give their services, and who would command the respect of the superintendents of the institutions engaged in the treatment of mental disease. Sir Maurice Craig, in his evidence to the Royal Commission, said that he had seen in the Board of Control a considerable change and progress in methods; his former criticism had passed away, and he believed that there was evidence that they were doing their work well and in a progressive manner. The House must not forget the matters which were naturally left out of the Bill, and which appeared in the Royal Commission's report. There were two germane matters which did appear in the Bill, which were of immense importance to the treatment of the individual before and after treatment institutions. Those were the systems of after-care and medical hygiene generally. There were many associations which undertook this voluntary work, which was invaluable. Some power was given for after-care, and in committee they would want to extend the powers given to after-care associations in various ways, because everybody would realise that the real trouble of the temporarily insane person began when he got back to his own home, especially in the poorer homes. These people then met all the weight of domestic responsibility and domestic trouble and inconvenience, and had to fend for themselves. The whole of the good done by six months' or a year's rest in an institution might be dissipated in three months if there was not sufficient after-care. Above all, they must remember that they wanted to be able to treat cases as early as possible, with a view to preventing many of the 50,000 people who were now in mental institutions from having to undergo institutional treatment. With newer ideas and newer possibilities they hoped to get them early and develop the prevention, rather than have to engage in the cure of the hopelessly insane.

(To be continued.)

HOUSE OF COMMONS.

WEDNESDAY, FEB. 12TH.

Lunatics and Cottage Homes.

Major GLYN asked the Minister of Health whether, before his department agreed to the maintenance of lunatics in cottage homes in rural areas, he would ascertain the opinions of the county councils, in view of the effect such a proposal would have in many villages.—Mr. GREENWOOD replied: All relevant considerations will, of course, be borne in mind before effect is given to any proposals of this nature.

Notification of Cancer.

Major GLYN asked the Minister of Health whether, on account of the public concern and uncertainty regarding the cause and effect of cancer, he would consider having this disease made notifiable, thus enabling the Cancer Research Council to obtain extra data and assisting local practitioners to obtain specialist advice in the earliest stages of treatment. —Mr. GREENWOOD replied: I do not think that compulsory notification of cancer, which would probably entail legislation, would be effective in securing early diagnosis, which I am advised is the first essential.

THURSDAY, FEB. 13TH.

Death from Anthrax.

Mr. JOWETT asked the Home Secretary whether his attention had been called to the death from anthrax of Mrs. Lily Kalaher, who had been employed as a woolsorter by Messrs. William Root, Limited, of Bradford, and to the evidence given by Dr. Eurich, bacteriologist, at the inquest to the effect that the grey Syrian wool that she had been sorting ought to be scheduled as dangerous, and that the disinfectant used as a precaution against anthrax at the mill was useless; and, if so, whether he intended to schedule grey Syrian wool as a dangerous wool without further delay. —Mr. CLYNES replied: I have received a report on this case by the factory inspector who attended the inquest. This shows that Dr. Eurich gave evidence to the effect suggested in the question, but it also appears that previous to the onset of the disease the unfortunate woman had been sorting other material besides grey Syrian wool, and the precise origin of the infection does not seem to have been established at the inquest. The question of an extension of the Wool Sorting Regulations deserves and will receive prompt and serious consideration, but it will be necessary, before any decision is reached, to make further inquiries and review the position in the light of all the information available. I may add that the inspector reports that the requirements of the Regulations were fully observed by this firm, and were applied not only to scheduled but also to non-scheduled wools, so that even if grey Syrian wool had been scheduled, it would not, apparently, have made any difference in this case.

Diagnosis and Treatment of Silicosis.

Mr. HOFFMAN asked the Home Secretary whether in the legislation he proposed to introduce setting up medical boards for the purposes of the diagnosis and treatment of silicosis, for research purposes and training, the central bureau is to be in Sheffield; and when it was proposed to introduce such legislation.—Mr. CLYNES replied: Yes, Sir, it is contemplated that the centre of the new organisation which would be set up for the purposes of the medical examinations required under the Act, should be at Sheffield. I regret I am not in a position to say when the proposed Bill will be introduced.

Psittacosis.

Sir GEORGE BOWYER asked the Minister of Health: (1) whether he would adopt the suggestion made by Lord Dawson, that an embargo be placed upon the importation of all parrots for a reasonable period, in view of the danger of a spread of parrot disease; and (2) whether he had received notice of the warning of an epidemic of parrot disease which was given last week by the doctor at the inquest on Miss Rogers, who died from psittacosis; and what steps the Ministry of Health were taking to assist in the diagnosis and treatment of this disease.—Mr. GREENWOOD replied: I have seen a newspaper report of the inquest on this case. The steps which have been and are being taken by my department in this matter are summarised in a memorandum which has recently been issued to local authorities and is now on sale. The question whether it is desirable to place any restrictions on the importation of parrots is under consideration, but I am not at present satisfied that such measures are necessary for the protection of the public health.

Dietary and Dental Decay.

Lieut.-Colonel FREMANTLE asked the Minister of Health whether his attention had been drawn to the researches at Sheffield University, now being published by the Medical Research Council, into the effect of a proper dietary for expectant others and for children in the prevention of dental decay; and whether he would issue to maternity and child welfare centres a paper of simple information and guidance for those attending such centres.—Mr. GREENWOOD replied: The answer to the first part of the question is in the affirmative. As regards the second part, it is the common practice at these centres to give advice as to a correct dietary, including instruction with a view to the prevention of dental decay, and as at present advised I do not consider it necessary to issue any special paper on this subject.

Dogs and Vivisection Experiments.

Mr. FREEMAN asked the Home Secretary whether any experiments by vivisection were conducted or allowed with the object of benefiting dogs; and, if so, how many were performed last year.—Mr. CLYNES replied: Such experiments would be allowed in suitable cases. During 1929, 451 experiments (all inoculations), of which 74 were on dogs, were performed with the object of discovering a prophylactic serum for distemper. No doubt other of the experiments performed were done with the direct or indirect object of benefiting dogs, but the information in my possession does not enable me to distinguish them with any certainty.

MONDAY, FEB. 17TH.

Pasteurised Milk and Tubercle Germs.

Mr. LAWTHER asked the Minister of Health if any examinations of samples of pasteurised milk by any public authorities had shown evidence of living germs of tuberculosis?—Mr. GREENWOOD replied: I understand that some samples of milk alleged to have been pasteurised have been found by local authorities to contain tubercle bacillus.

Mr. LAWTHER asked the Minister of Health if any examinations which had been made of tuberculous material showed the presence of bovine tubercle bacillus in children who had been brought up entirely on pasteurised milk?—Mr. GREENWOOD replied: I am not aware of any examinations which have shown the presence of bovine tubercle bacillus in such children.

Certified and Grade A Milk and Tuberculosis.

Mr. Lawther asked the Minister of Health what examinations, if any, had been taken of samples of certified and T.T. (Grade A) milks by public authorities; and if such samples had shown any evidence of living germs of tuberculosis?—Mr. Greenwood replied: These milks are not examined for tubercle bacillus as a matter of routine, and I cannot say how many samples have been so examined. I have reports of a few instances in which tubercle bacillus has been found in the milks.

Punishment by the "Cat."

Dr. Hastings asked the Home Secretary in how many cases, if any, during the last five years the administration of punishment by the cat had taken place in two or more stages?—Mr. Clynes replied: In no case within the memory of present officers of the prison service has the administration of corporal punishment taken place in two or more stages. If the medical officer stops a flogging on medical grounds that is final, and the flogging is never resumed at a later date.

Humane Slaughter of Animals.

Lieut.-Colonel Moore asked the Minister of Health the total number of local authorities in England and Wales who had adopted the Ministry's model bye-law 9b in regard to the humane slaughter of animals up to Jan. 31st?—Miss S. Lawrence (Parliamentary Secretary to the Ministry of Health) replied: The number is 349.

Hygienic Methods of Handling Fish.

Mr. Arthur Michael Samuel asked the Minister of Agriculture whether he was framing suitable regulations, to be enforced by law, to ensure more hygienic methods at sea for handling and packing trawled fish, so as to retard what was technically known as autolysis, and to reduce contamination by bacterial infection?—Mr. Buxton replied: Although the report on the handling and stowage of white fish at sea was only published by the Department of Scientific and Industrial Research very recently, steps are already being taken by some owners to equip their vessels with the apparatus necessary for carrying out its recommendations. It is not yet clear to what extent the recommendations can be adopted in commercial practice, but I am confident that legislation will not be required to induce trawler owners and fishermen to take advantage, to the limit of practicability, of the information furnished by the report.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Monday, Feb. 24th.—8 P.M., Odontology. Paper: Dr. Georges Villain (Paris): The Problem of Stabilisation and Articulation of Dentures.

Tuesday.—5 P.M., Medicine. Discussion on The Treatment of Lung Abscess. Openers: Dr. F. G. Chandler and Mr. A. Tudor Edwards. Followed by Dr. L. S. T. Burrell and Mr. J. E. H. Roberts.

Wednesday.—5 P.M., Comparative Medicine. Discussion on Canine Distemper. Openers: Mr. Thomas Dalling and Mr. George W. Dunkin. Other speakers will also take part.

Thursday.—Urology. Meeting at Liverpool at the invitation of the Liverpool Medical Institution. 8.30 A.M. Train from Euston (breakfast train). 12.35 P.M. Arrive Liverpool. Lunch at University Club (opposite Adelphi Hotel). Operations at four Liverpool Hospitals. 3.45 P.M. Clinical Pathological Meeting at the Liverpool Medical Institution. 5.20 P.M. Return train from Liverpool. 9.5 P.M. Arrive Euston.

Friday.—5.30 P.M., Disease in Children. (Cases at 4.30 P.M.) 8 P.M., Epidemiology. Paper: Sir Leonard Rogers: Further Experience in Forecasting Epidemics in India and their Bearing on the Reduction of Cholera Epidemics.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

Monday, Feb. 24th.—8.30 P.M., Discussion on the Treatment of Syphilis, to be introduced by Colonel L. W. Harrison.

Wednesday.—9 P.M., Sir John Thomson-Walker: Enlarged Prostate and Prostatectomy (Second Lettsomian Lecture).

ROYAL INSTITUTION, Albemarle-street, W.

Thursday, Feb. 27th.—5.15 P.M., Mr. J. B. S. Haldane: Some Problems of Genetics.

MEDICO-LEGAL SOCIETY, 11, Chandos-street, Cavendish-square, W.

Thursday, Feb. 27th.—8.30 P.M., Lieut.-Colonel Henry Smith: The Forging of Seals and Finger Prints and its Remedy. With demonstrations.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W.

Friday, Feb. 28th.—8.30 P.M. Papers will be read by Dr. S. H. Browning and Mr. P. G. Doyne on Syphilitic Diseases of the Eye. A Discussion will follow.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

Thursday, Feb. 27th.—5 P.M., Dr. J. A. Glover: The Incidence of Rheumatic Diseases. (First Milroy Lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, Feb. 24th, to Saturday, March 1st.—Medical Society Lecture Room, 11, Chandos-street, Cavendish-square, W., Tues., at 4 P.M., Lecture by Prof. Dame Louise McIlroy: Lantern Demonstration of the Management of Abnormal Labour. No fee.—All Saints Hospital, Vauxhall Bridge-road, S.W. Wed., 2 P.M., Clinical demonstration, Mr. R. Coyte: Cystoscopies. No fee.—Infants Hospital, Vincent-square, S.W. Fri., 4 P.M., Demonstration, Dr. Eric Pritchard: Difficult Cases of Feeding. No fee.—Children's Clinic and Other Hospitals, Post-graduate Course in Diseases of Children, Afternoon and some mornings. Two weeks.—Royal Eye Hospital, St. George's-circus, S.E. Series of demonstrations on the Diagnosis and Treatment of Diseases of the Eye. *Mon. to Fri., for two weeks daily.—Hospital for Tropical* Diseases, Gordon-street, W.C. Clinical demonstrations, Tues. and Thurs. afternoons at 2 P.M.—Further particulars from the Fellowship of Medicine.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark Hill, S.E.

Thursday, Feb. 27th.—9 P.M., Dr. Sydney Thomson: Ringworm.

NATIONAL HOSPITAL POST-GRADUATE COURSE, Queen-square, W.C.

Monday, Feb. 24th.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Mr. Leslie Paton: Control of Ocular Movements.

Tuesday.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Central Disorders of Vision.

Thursday.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Mr. Just: Deafness in Relation to Intracranial Disease.

Friday.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Mr. Elmquist: Demonstration of Re-educative Exercises.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

Monday, Feb. 24th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

Tuesday.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

Wednesday.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

Thursday.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat, and Ear Clinics. *Operations.*

Friday.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases. Clinics. Operations.

ROYAL NORTHERN HOSPITAL, Holloway.

Wednesday, Feb. 26th.—3.15 P.M. (at the Royal Chest Hospital). Dr. F. E. Saxby Willis: Diaphragmatic Hernia.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

Friday, Feb. 28th.—4 P.M., Mr. F. Walkyn-Thomas: Intrinsic Carcinoma of the Larynx.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

Tuesday, Feb. 25th.—5 P.M., Dr. G. B. Dowling: Seborrhœa. Seborrhœic Dermatitis.

Thursday.—5 P.M., Dr. K. Sibley: Electrotherapeutics.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.

Wednesday, Feb. 26th.—4 P.M., Mr. V. Zachary Cope: Demonstration of Surgical Cases.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE, Keppel-street, W.C.

Thursday, Feb. 27th.—5 P.M., Dr. W. G. Savage: Food Poisoning. The lecture is open to the public.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, 49, Leicester-square W.C

Wednesday, Feb. 26th.—4.15 P.M., Clinical Cases. 5 P.M., Dr. Kenneth Wills: The Infectivity of the Seborrhœic Organism.

ST. MARY'S HOSPITALS, Manchester.

Friday, Feb. 28th.—4.15 P.M. (at the Whitworth-street West Branch), Dr. J. Crighton Bramwell: Cardiac Complications of Pregnancy. (Post-graduate Lecture.)

ANCOATS HOSPITAL POST-GRADUATE COURSE, Mill-street, Manchester.

Thursday, Feb. 27th.—4.15 P.M., Mr. E. E. Hughes: Renal Tuberculosis.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

Friday, Feb. 28th.—3.30 P.M. (at the Royal Infirmary), Dr. R. Platt: Applied Physiology in the Diagnosis and Treatment of Renal Disease.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

Wednesday, Feb. 26th.—4.15 P.M. (at the Western Infirmary), Mr. J. Mill Renton: Surgical Cases.

Appointments.

Pinto-Leite, H., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Superintendent to the Hospital of S.S. John and Elizabeth, Grove End-road, N.W.

Semple, A., M.B., Ch.B. Glasg., D.P.H., Medical Officer of Health, Carlisle.

Stirling, T. S., M.B., Ch.B. Glasg., D.P.H. Camb., Assistant County Medical Officer of Health for Somerset.

St. John's Hospital, Lewisham: **Gibbens, J. H.**, M.A., M.R.C.P. Lond., M.R.C.S., Physician in Charge of the Children's Department; **Yeo, K. J.**, M.B., B.Chir. Camb., D.M.R.E., Physician in Charge of X Ray Department; and **Brockman, E. P.**, M.Chir. Camb., F.R.C.S. Eng., Surgeon in Charge of Orthopædic Department.

Vacancies.

For further information refer to the advertisement columns.

Ashford Hospital, Kent.—H.S. £160.

Ashton-under-Lyne District Infirmary.—H.S. At rate of £150.

Barrow-in-Furness, North Lonsdale Hospital.—H.S.'s £150.

Bath, Royal United Hospital.—H.S. At rate of £150.

Birkenhead General Hospital.—Sen. H.S. and H.P. At rate of £150 and £100 respectively. Also Cas. O. £100.

Birmingham, Queen's Hospital.—Three H.P.'s, H.S., Anæsthetist. Also Dental H.S. Each £70.

Birmingham Union, Western House.—Asst. M.O. £500.

Birmingham University.—Asst. Lecturer and Demonstrator in Anatomy. £300.

Bootle Borough Hospital.—Two Jun. H.S.'s. Each at rate of £150.

Bradford Royal Eye and Ear Hospital.—Jun. H.S. £150.

Bradford, St. Luke's Municipal General Hospital.—H.P.'s. and H.S.'s. Each at rate of £200.

Burnley, Victoria Hospital.—H.P. At rate of £125.

Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.

Canterbury, Kent and Canterbury Hospital.—H.S. At rate of £125.

Cardiff Royal Infirmary.—Radium Registrar. At rate of £200.

Carlisle, Cumberland Infirmary.—H.P. Also H.S. to Special Depts. Each at rate of £155.

Central London Ophthalmic Hospital, Judd-street, W.C.—Hon. Dental Surgeon.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Two Hon. Assts. to Out-Patient Dept.

Charing Cross Hospital, W.C.—Med. Reg. £150. Obst. Reg. £100. Also Registrar to Ear, Nose, and Throat Dept. £100.

City of London Maternity Hospital, City-road, E.C.—Res. M.O., also Asst. Res. M.O. At rate of £100 and £80 respectively.

Connaught Hospital, Orford-road, E.—Sen. Res. M.O. At rate of £150. Also Res. H.S. and H.P. Each at rate of £100.

Dartford, Kent, Darenth Training Colony.—Med. Supt. £1000.

Dewsbury County Borough.—Deputy School M.O., &c. £600.

Doncaster Royal Infirmary.—3rd H.S. At rate of £150.

Dreadnought Hospital, Greenwich.—Phys.-in-charge of Out-Patients.

Dudley, Guest Hospital and Eye Infirmary.—Asst. H.S. £150.

Eastern Dispensary, Leman-street, E.—Ophthalmic Surgeon.

East Ham Memorial Hospital, Shrewsbury-road, E.—Res. M.O. At rate of £200.

Evelina Hospital for Children, Southwark, S.E.—Hon. Surgeon to Out-patients.

Exeter, Royal Devon and Exeter Hospital.—H.P. At rate of £150.

Great Yarmouth General Hospital.—Sen. H.S. £180.

Greenwich Union.—Asst. M.O. £300.

Halifax Corporation Isolation Hospital.—Res. M.O. £350.

Hertford County Hospital.—Res. Surg. O. At rate of £250.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. and H.P. Each at rate of £100.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Asst. Phys.

Huddersfield Royal Infirmary.—H.S. £150.

Hull Royal Infirmary.—Cas. H.S. At rate of £130.

Ipswich, East Suffolk and Ipswich Hospital.—Two H.S.'s. Each £120.

Kent County Council.—Asst. M.O., &c. £600.

Kingston-upon-Hull, City Fever Hospital and Sanatorium.—Med. Supt. £800.

Kingston-upon-Hull, City and County of.—Tuberculosis Officer. £800.

Liverpool, Walton Institution, Rice-lane.—Res. Asst. M.O. £200.

L.C.C. Mental Hospitals Service.—8th Asst. M.O. £445.

L.C.C., Public Health Department.—M.O. £715.

Leicester Health Dept.—Temporary M.O. 10 gns. per week.

Leicester Royal Infirmary.—Two H.P.'s, also H.S.'s. Each £125.

London Hospital, E.—Med. First Asst. and Reg. £300.

Maidstone, Kent County Ophthalmic and Aural Hospital.—Ophth. H.S. At rate of £200.

Manchester, Ancoats Hospital.—H.S. At rate of £100.

Manchester City.—M.O. for Maternity and Child Welfare. £600.

Manchester, County Mental Hospital, Prestwich.—Asst. M.O. £500.

Manchester Royal Children's Hospital.—Two Asst. M.O.'s for Out-Patients' Dept. Each at rate of £150. Also Res. Surg. O. At rate of £125.

Mile End Hospital, Bancroft-road, Mile End, E.—Res. Asst. M.O. £150.

Miller General Hospital, Greenwich-road, S.E.—Res. M.O., Cas. O., and H.P. At rate of £250, £150, and £125 respectively.

National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. At rate of £150.

Newcastle-on-Tyne, Hospital for Sick Children.—Jun. H.S. At rate of £100. Also Res. Sen. H.S. and Res. H.P. Each at rate of £95.

Northampton General Hospital.—Two H.S.'s, also Two Asst. H.S.'s. Each at rate of £150.

Northern Rhodesia, Roan Antelope Copper Mines, Ltd.—Jun. M.O. £900–£1000.

Plymouth City Mental Hospital, Blackadon, Ivybridge.—Med. Supt. £750.

Preston and County of Lancaster Royal Infirmary.—H.S. £150.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Res. Anæsthetist. At rate of £80.

Queen Mary's Hospital for the East End, E.—House Anæsthetist and H.P. At rate of £120.

Rochester, St. Bartholomew's Hospital.—Res. Radiologist. £150.

Royal National Orthopædic Hospital, Great Portland-street, W.—H.S. At rate of £150.

St. John's Hospital for Diseases of the Skin, 49, Leicester-square, W.C.—Sen. and Jun. Hon. Med. Registrars.

St. Mark's Hospital for Cancer, Fistula, and Other Diseases of the Rectum, City-road, E.C.—H.S. At rate of £75.

St. Paul's Hospital for Diseases of the Genito-Urinary Organs and Skin, Endell-street, W.C.— H.S. At rate of £150.

St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, W.C.—H.S. At rate of £75.

St. Thomas's Hospital, S.E.—Radium Reg. and Asst. to Radiological Dept. £250.

Salford Royal Hospital.—H.P., two H.S.'s, and Cas. H.S. All at rate of £125.

Sheffield, Jessop Hospital for Women.—Asst. H.S. At rate of £100.

Sheffield University, Dept. of Pathology and Bacteriology.—Asst. Bacteriologist. £300.

Southampton Free Eye Hospital.—H.S. £150.

Southampton, Royal South Hants and Southampton Hospital.—H.P. At rate of £130.

Stafford, Staffordshire General Infirmary.—H.S. and H.P. At rate of £200 and £100 respectively.

West Bromwich and District General Hospital.—H.S., H.P., and Cas. H.S. Each at rate of £200.

West London Hospital, Hammersmith-road, W.—H.P., Two H.S.'s and Res. Anæsthetist. Each at rate of £100. Hon. Asst. Surg., Hon. Med. Reg., and Hon. Obstet. Reg.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Four Chief Clin. Assts. Each 1 gn. per session.

Westminster Hospital, Broad Sanctuary, S.W.—Clin. Asst. to Dental Dept.

Willesden General Hospital, N.W.—Res. H.S. £100.

Willesden Municipal Hospital.—Res. M.O. £150.

Willesden U.D.C.—Two Dentists. £572 6*s.* 4*d.* Also Part-time Anæsthetist and Part-time Oculist. At rate of £300 and £225 respectively.

Windsor, King Edward VII. Hospital.—Res. M.O. £200. Also Sen. H.S. £140.

Births, Marriages, and Deaths.

BIRTHS.

Dodd.—On Feb. 11th, at a London nursing home, the wife of Charles Tattershall Dodd, L.D.S.R.C.S. Eng., of "Glen gowan," Thames Ditton, of a son.

Garfield.—On Feb. 13th, to Marguerite Garfield, M.R.C.S., L.R.C.P., wife of Montagu Garfield, M.R.C.S., L.R.C.P., L.D.S., of Palmeira Mansions, Hove—a son.

Tooth.—On Feb. 14th, at Clare House, Albion-street, Lewes, the wife of Dr. R. S. Tooth, of a daughter.

MARRIAGES.

Vere-Hodge—Walters.—On Feb. 14th, at Essex Church, Kensington, by the Rev. C. J. Street, M.A., LL.B., Gwendolen Sykes, daughter of Dr. and Mrs. Walters, of Pinecroft, Farnham, Surrey, to Harry Kirke Vere-Hodge, also of Farnham.

DEATHS.

Evans.—On Feb. 13th, Dr. John Evans, D.S.O., at Bryniau, Caernarvon.

Gough.—On Feb. 6th, at 3, Buckingham Gate, London, Elizabeth Marion Gilchrist, wife of Harold R. Gough, and only daughter of Dr. and Mrs. Anthony McCall, of Bournemouth.

Jordan.—Suddenly, after a brief illness, George Robert Leslie Jordan, M.B., B.Ch. (T.C.D.), High-street, Halstead, Essex, aged 34.

Llewelyn-Jones.—On Feb. 13th, from pneumonia, after a short illness, John Llewelyn-Jones, M.D., aged 57.

Moore.—On Feb. 11th, at Priory-road, Kew, Hubert William Moore, L.D.S.R.C.S. Eng.

Roche.—On Feb. 11th, suddenly, at Sheringham, Dr. E. B. Roche, aged 81.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

ESTIMATION OF DANGERS OF AVERTIN.

DETERMINATION of mortality-rates of anæsthetics is one of the least satisfactory of statistical exercises. The factors that may play a part in the causation of death during anæsthesia are so many and so variable that in any given case it may be impossible to attribute the end to any one or even to any two definite causes. It is not surprising therefore to find a vigorous defence put up against the accusations which H. Killian brought against the rectal anæsthetic, avertin. E. Glaesmer[1] shows that in the series of 16 fatalities associated with avertin which Killian had collected there was insufficient discrimination between various factors involved in the fatalities, and certainly not enough evidence to incriminate the anæsthetic per se. Obviously if the anæsthetic is held to account when death occurs after a formidable operation on a patient in the last stages of exhaustion a just view of the danger of that anæsthetic has not been taken. In fact any anæsthetic would come out of the ordeal with an equally unfavourable record. Again if patients who are unsuitable subjects for the anæsthetic succumb to its effects, the anæsthetic should not be burdened with the blame. We do not regard ether as dangerous because patients suffering from acute bronchitis succumb if they are subjected to long inhalations of the drug. Equally we must not blame avertin if fatality follows its employment on those who are suffering from severe disease of liver or kidneys. As E. Glaesmer properly points out, with every new anæsthetic we must learn its particular suitabilities and contra-indications, and until these are familiar and generally acted on it is little use trying to state a mortality-rate for the drug.

HALF-MINUTE THERMOMETRY.

Dr. H. W. Hales (Sheringham, Norfolk) writes: "Although thermometers are stamped by the National Physical Laboratory, Kew, as a guarantee of the accuracy of their reading, I have frequently found that a true reading is only obtained after five or ten minutes, when the instrument is stamped as a 'half-minute.' This seems to apply to the very subnormal temperatures, and not to any extent to those above 98·4° F. Seeing that temperatures of 95·6° to 96·6° F. are very much more common than is generally supposed, the matter seems to be of considerable clinical importance. Can you tell me the reason for this peculiarity? My own temperature frequently runs at a very subnormal level, so I have been able to test the accuracy of my statements on many occasions with many different thermometers, and controls have been made on numerous patients."

The Kew Certificate is no longer compulsory, but even a perfect "half-minute" thermometer can only give a correct reading in a cavity whose temperature is constant, such as the rectum. The temperature of the mouth, even in the alcove beneath the tongue, is affected by the currents of air which have recently passed through the mouth of the patient. This effect is so pronounced that a mouth reading, except in cases of fever, requires at least a minute, and often three minutes or more, to reach its proper level. Anyone can ascertain this for himself who will take the trouble of watching the mercury rise after the thermometer has been placed in the patient's mouth. When the surrounding atmosphere is cold the correct mouth reading is still more delayed, and in alpine sanatoriums where mouth temperatures are taken it is often the rule for the thermometer to remain in situ for ten minutes, whatever may be the length of time that the thermometer itself takes to register. On the other hand, a "three-minute" thermometer will give a correct reading in half a minute in the rectum, or in still shorter time in the stream of urine. Briefly a "half-minute" thermometer requires a "half-minute" medium.

DOCTOR'S CONSULTING ROOMS AT CHEMISTS' SHOPS IN SOUTH AFRICA.

THE following resolution passed by the Associated Pharmaceutical Societies of South Africa was submitted at the annual meeting of the South African Pharmacy Board, held at Bloemfontein, on Jan. 15th: "That the Medical Council and Pharmacy Board be asked (*a*) to take steps to prevent medical practitioners from having consulting rooms attached to chemists' shops, and displaying their name-plates on the chemists' premises; (*b*) to debar the use of prescription pads and envelopes which have the name and address of a chemist printed thereon." The Registrar explained that the Board at its last meeting decided to ascertain the views of the Medical Council on the subject. This was done, and the reply of the Medical Council was to the effect that it was not prepared to do anything in connexion with the first point. With regard to the second, the Medical Council had decided to make it one of the matters which would be liable to the Council's disciplinary powers. Mr. J. Christie, M.L.A., the Chairman, announced that the Bloemfontein chemists had notified him that they were opposed to the Board taking any steps relative to the question of consulting rooms and name-plates of medical practitioners attached to chemists' premises on the ground that the matter rested with the Medical Council. After discussion it was agreed to notify the Associated Pharmacy Societies that the Board "considers both practices undesirable." It realised that the first-mentioned practice was one of very long standing, but considered that it would in time die out of its own accord. With regard to the second practice, the Board would like to see this cease at once.

METALIX TUBES.

A 35-page brochure on Metalix X-ray tubes is issued by Philips Lamps, Ltd. (145, Charing Cross-road, London, W.C.2), and will be found of value to users and potential users of these tubes. The first 15 pages are devoted to an account of the general aim of the makers to supply the varying requirements of radiographic work; three tubes have been produced, known as 2·5, 6, and 10 kw., an adequate description of the conditions under which each should be worked and maintained being given. The brochure also contains valuable information on design, working efficiency, and cost to which reference might with advantage be made by those engaged in radiographic work.

MANIC-DEPRESSIVE PSYCHOSIS.

Sir Robert Armstrong-Jones, who presided at the meeting of the Section of Psychiatry, Royal Society of Medicine, on Feb. 11th (reported on page 353 of our last issue), would have made the following concluding remarks had time permitted:—

Manic-depressive insanity expresses the whole of the symptom-complex. The "entity" was first described by Fabret as "folie circulaire," and later by Kraepelin by its present title. It has nothing to do with neurasthenia, but much with heredity. It is merely an exaggeration of the normal mental rhythm, and of all the mental abnormalities it is the one best known to the family doctor; only in its severer forms is it known to the specialist—whether he is styled neurologist or psychiatrist—and only in its gravest forms does it come under certificates. Those not conversant with insanity cannot realise the dread of a relapse felt by the sufferer, and something must be done for him. Bevan Lewis attributed its pathology to some metabolic change in the cortical neurons; melancholia being a slight change and mania a deeper one, but of the same kind, and constituting what he described as a state of *labile equilibrium.*

The disease always comes on suddenly, without prodromal symptoms (unlike ordinary mania and melancholia). There *are no hallucinations or delusions, and for this reason* it has been called *mania* (or *melancholia*) *raisonnante.* There is complete return to lucid intervals—a complete *restitutio ad integrum*, and no dementia follows. The treatment aimed at is to break the habit (or, as Savage said, "abort" the rhythm). The first thing the physician always does in every disease is to change the diet. A strong aperient, such as calomel, jalap, or the stronger salines may stop an attack. Bromides are absolutely necessary to "jam down" or repress hyperæsthetic centres. Long immersion baths may help.

A THERMO RADIO PAD.

Radium Electric Ltd., of 24, Grosvenor-gardens, London, S.W.1, have submitted for our inspection an electrically heated pad which serves as a portable and equable source of heat, the effect of which is enhanced by radium emanation. The radio-active substance which is safely embedded in the pad is of a standard guaranteed by the Radium Institute of Vienna to be not less than 0·01 mg. per pad. The wiring is insulated in asbestos, and a three-way switch provides further maintenance of three different constant temperatures, a thermostat automatically cutting off the current when the desired heat is reached. The whole is enclosed in a damp-proof layer of Billroth tissue with a washable linen cover. The pad can be supplied for any voltage, and has simply to be affixed by its wire to any available lamp-bracket or wall-plug. The running cost, even at 6*d.* per unit of current, only amounts to about a penny for four hours. The general construction of the pad has also been tested at the Faraday House Laboratories, and is described as satisfactory. The cushion, which is briefly described as the "Q-Ray," costs three guineas, and may be had direct from the manufacturers, or from chemists and electrical dealers. A number of the pads are stated to be in use at various hospitals and sanatoriums in Vienna, and their application is suggested in such conditions as lumbago, neuralgia, sciatica, or any painful inflammatory condition.

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[1] Münch. med. Woch., Dec. 13th, 1929.

Hunterian Lecture

ON

RADIUM TREATMENT OF CARCINOMA OF THE BREAST.

Delivered before the Royal College of Surgeons of England on Feb. 3rd, 1930.

BY GEOFFREY KEYNES, M.D. CAMB.,
FELLOW OF THE COLLEGE; ASSISTANT SURGEON TO ST. BARTHOLOMEW'S HOSPITAL.

THE history of the use of radium in treating carcinoma of the mammary gland is necessarily brief, and, indeed, only since 1920 has its application come to be regarded as anything more than a palliative for those unhappy patients in whom no operation was feasible.

It will clear the ground if I indicate broadly the three possible methods of using radium in this disease.

1. It may be applied externally in the form of plaques or as batteries of needles over a diffracting medium, such as the mixture of wax and sawdust known as Columbia paste.
2. It may be applied at a distance, using the beam of rays from a mass of radium contained in the so-called "bomb."
3. It may be buried in the tissues in suitable containers.

It is only with the last of these methods that I shall deal, as circumstances determined that this method was the one which we chose to use in the first place for our investigation, and we have used it consistently ever since. Had there been no other reason in its favour, the use of interstitial irradiation was to be preferred, as it is by far the most economical of radium.

The first treatment by this method given by the Surgical Professorial Unit at St. Bartholomew's Hospital under Prof. G. E. Gask took place in 1921. After three years' experience it became clear that recurrent nodules could be made to disappear by interstitial irradiation. In logical sequence the first treatment given to a patient with primary carcinoma of the breast took place on August 1st, 1924. Up to the present time 154 patients with primary carcinoma of the breast have been treated, and as far as I know no comparable series of radium treatments has been described at any other clinic in the world.

SURGERY OF THE BREAST.

The history of the surgery of carcinoma of the breast has been, as in the surgery of most other parts of the body, that of a progression from crudity to refinement; there has also been a progressive increase in the extent of the operation up to the anatomical limits of accessibility. This has been influenced chiefly by increased knowledge of the lymphatic drainage of the breast, and the foundations of this knowledge were laid by Sappey about 1885. Before this, in 1878, Halsted, of Baltimore, had emphasised the frequency of lymphatic extension to the glands above the clavicle and in the anterior mediastinum. He had even advised a routine resection of the clavicle, and removal of the tissues above it and below, and Harvey Cushing, working in his clinic, had also removed the glands from the anterior mediastinum in a few patients, but neither of these procedures has been generally used. The third special contribution in this field was made by Sampson-Handley, whose theory of centrifugal permeation has greatly influenced procedure in the direction of removing at operation more skin and more deep fascia, until a great part of the chest wall has been denuded. At the present time most surgeons content themselves with a wide removal of skin, a wider denudation of the chest wall, including removal of the pectoralis minor and the greater part of pectoralis major, and a careful dissection of the vessels in the axilla. The degree of mutilation necessitated by this operation is undeniably great, though the disability caused by the removal of the pectoral muscles is less than might be expected. A frequent complication has been œdema of the arm resulting from interference with the lymphatic drainage. In spite of the severity of the operation, operative mortality has been low. Final results have proved very difficult to assess, and with so many variable factors the published figures have differed within wide limits. In my own experience the results obtained in unselected cases, none being rejected except such as were obviously "inoperable," have not been good. It has been borne in upon me by observation of my own patients and those of other surgeons that frequently the disease is actually disseminated by the operation, secondary growths appearing in the surrounding skin or at a distance more quickly and more widely than if the patient had had no treatment at all. It is possible that dissection with the diathermic current instead of with the ordinary scalpel may, to some extent, prevent this, but I believe that any operative interference may stimulate to activity many carcinoma cells which would otherwise have remained quiescent. I have made these brief remarks upon surgical treatment partly to outline its principles, partly to suggest that, although there is always likely to be a considerable field for pure surgery in mammary carcinoma, it is reasonable to consider whether there may not be a better alternative—namely, radium.

TECHNIQUE OF RADIUM TREATMENT.

The form of radium treatment that we have used at St. Bartholomew's has been based strictly upon surgical principles. It has consisted in the burying of platinum needles containing radium in such a way that both the primary growth and every accessible area of lymphatic drainage has been subjected to adequate irradiation. The details of technique have already been fully described elsewhere.[1] I need only indicate here the usual distribution of radium needles: (1) beneath the breast itself, (2) beneath the pectoral muscles, (3) in the axilla, (4) on the costocoracoid membrane, (5) above the clavicle, (6) in the upper three or four intercostal spaces. It will be seen from this that radium needles may be divided into two main groups, those in relation to the mammary gland and the primary growth, and those in relation to the lymphatic drainage. The needles of the second group are placed as a routine in the positions indicated. Those of the first group are a highly variable quantity, the size of the tumour and of the mammary gland, and therefore of the area to be covered, varying within wide limits. The second variable factor is the time of exposure, and this has been arrived at empirically by trial. Experience has shown that the optimum time is about 168 hours—that is, seven days—and it is seldom necessary to depart from this standard, which has obvious advantages in facilitating hospital organisation. Thus the main principle has been a prolonged exposure to a relatively small dose of radium, the same principle which has been extensively used in other parts of the body. The relatively small size of the dose might arouse doubts as to whether adequate penetration of the rays is being obtained. For, although we may occasionally place a few needles in the plane of the main mass of growth, most of the needles are purposely put deep to it, and so usually deep to the mammary gland, partly because pushing needles into a growth may cause necrosis, partly because carcinoma cells might be displaced and disseminated, partly because the tissue is often so tough that damage to needles may result, and finally because in practice it appears to be unnecessary to place them in the growth. In many cases the mass of growth has been so thick that clearly the cells further away from the radium can only have received a fraction of the intensity directed upon those close to it, and often the intensity must have fallen below what was theoretically necessary to constitute a lethal dose, and yet the whole tumour has disappeared. Actually, therefore, it seems that the length of the time factor compensates for lessened intensity, and probably there are other biological factors of which we are still unaware. In this connexion it is of interest to note that acquired insensitivity to the radiations, which has been so much of a bogy in the past, has not in this investigation been found to have much importance. Patients have received as many as four treatments, and usually the growth has responded as well on the later occasions as it did on the first, so that a very large growth has been caused to disappear in successive stages.

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[1] St. Bartholomew's Hospital Reports, 1927, lx., 203; THE LANCET, 1928, ii., 108; Acta Radiologica, 1929, x., 393.

This has been illustrated by the case of a patient first treated in July, 1926, for a large mass of carcinoma occupying the whole of the right breast and filling the right axilla. She had two further treatments at intervals of eight months with progressive improvement until no growth remained. In July, 1929, she was treated a fourth time for a small skin nodule just outside the area treated, and now, three and a half years after first being treated, she is without external signs of disease.

DIAGNOSIS.

In judging the value of any new form of treatment a properly critical mind will require some scientific proof that the condition treated was actually the disease that it was stated to be. With this in view, I set out to remove a specimen for section from every patient, taking the precaution to do this after the growth had been irradiated, when the cells might be supposed to have a diminished power of growth, and I hoped thus to avoid causing any dissemination of the growth by cutting into it. This proved to be an interesting experiment upon the biological side of the problem, for I proved that carcinoma cells, which would have disappeared had they been left undisturbed, were yet able to grow if transplanted to new surroundings. In other words, in more than one case, although the original tumour disappeared, an implantation growth appeared in the incision through which the specimen had been removed, and this had to be separately treated afterwards. In one patient this was disastrous, the implantation growth proving much more resistant than the original tumour. It was therefore clear that removing a specimen, though scientifically desirable, was contrary to the patients' best interests, and after proving that carcinoma was present in 50 consecutive patients I abandoned the practice as a routine. I thought it better to make an occasional mistake and treat a patient with radium who had not got carcinoma than to endanger the result in all of them. Actually I do not think any mistakes have been made, for the diagnosis of carcinoma on clinical grounds is seldom in doubt. If I felt uncertain, I either excised the lesion first, or else I placed the patient in a different category from the others for statistical purposes, and they are not included in my series.

RESULTS.

Surgical removal of a carcinoma of the breast results in the immediate and complete disappearance of the tumour, with consequent relief to the patient's anxieties. The psychological attitude after radium treatment has to be somewhat modified, for no miracle results, and after the needles have been removed the tumour is still there. It is important, therefore, for the patient's peace of mind to be able to give some prognosis of the probable course of events. Experience has shown that there is always an obvious change in the size of the tumour within two or three weeks. After two months it may have shrunk to half its original size, and within three months a small tumour may have completely disappeared. If the tumour is large, it sometimes happens that it goes on shrinking for much longer than this, but after a time, perhaps six to nine months, appears to be stationary. A doubt will then arise concerning the residual tumour, as to whether it still contains active carcinoma cells or whether it consists only of the fibrous matrix originally present. When this occurs I believe it will usually be wise to give a second radium treatment, which may result in further shrinkage or even disappearance of the tumour. If little change results, it is probable that the tumour consists only of fibrous connective tissue, as has been proved in more than one patient by subsequent local excision and histological examination. In spite of this, excision of a residual tumour should be done, for even after two treatments carcinoma cells may have survived on the surface which were screened from the rays by a great thickness of fibrous tissue forming the greater part of the residual tumour. From these specimens interesting information as to the action of radium on the carcinoma may be obtained, and this is illustrated by the following.

CASE 1.—A patient had a large mass of carcinoma adherent to the chest wall and inoperable. She received treatment in February and June, 1927, and there was very great improvement, but in November there was still a hard lump remaining, and this was excised. A section right through it shows disappearance of carcinoma cells except for some unhappy-looking remnants on the surface. The whole of the rest of the mass consists of fibrous tissue only. This patient is free from external recurrence three years after being first treated.

CASE 2.—A patient was first treated in May, 1926, after excision of a doubtful lump. Recurrence took place ten months later, and the growth was again treated. Five months later a residual mass was excised and was found to consist of fibrous tissue only. The patient remains well three and a half years after being first treated.

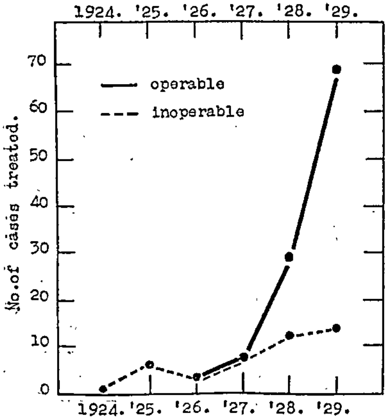
CASE 3.—A lady, aged 77, with a very large mass in the breast was treated in June, 1928, and a residual mass was excised six months later. Section showed that this consisted entirely of fibrous tissue, though "ghosts" could still be seen indicating the structureless remnants of some of the groups of carcinoma cells. This patient is quite well 19 months after being first treated.

Sometimes surgical excision may be contemplated for other reasons. The bulk of the tumour may have gone, and an ulcer, originally large, may have shrunk to a small size, retaining, however, a rim of little nodules around it. Local removal can then eradicate the disease; section proves the survival of some groups of carcinoma cells, but the disease does not recur, as is illustrated by the following case.

A patient was treated for an ulcerated carcinoma in September, 1927. A small residual ulcer was excised four and a half months later, and carcinoma cells were found, as was expected, immediately surrounding it. The patient is quite well two years and four months after being first treated.

These remarks will have indicated that there is still an important place for surgery in combination with radium treatment, but only individual experience can make the decision as to when it must be brought into play.

Before embarking upon an extensive radium treatment of unselected patients with carcinoma of the breast, it was clearly necessary to form some estimate of its possibilities. Patients were accordingly chosen first among those who had external recurrences following operation. It was shown that these recurrences could easily be made to disappear, though the patients' lives were seldom prolonged. In fact, of 22 patients treated in the years 1921–28 only two have survived to the present time. One of these patients, however, treated in 1926 for a large recurrent growth, is without signs of disease, and has been so for nearly four years. The local results obtained in these patients seemed to justify the extension of the treatment, and in August, 1924, the first patient with primary carcinoma of the breast received radium treatment. She was suffering from an ulcerated scirrhous carcinoma, which was adherent to the chest wall, and therefore inoperable. She received what would now be regarded as an inadequate dose, but the ulcer healed and the tumour was greatly reduced in size. A second treatment was given four months afterwards, and seven weeks later the area was excised. The patient remained quite well for five years and then developed a small nodule in the skin of the areola just outside the part treated. This has been irradiated, and the patient is at present without signs of disease. From this beginning in 1924 an increasing number of patients have been given radium treatment each year by the Surgical Unit at St. Bartholomew's under Prof. Gask and myself, and this progression is seen on the accompanying graph. A total of 154 patients has been treated to the present time. This is evidence of increasing confidence on the part of the surgeons concerned, an increase which is further illustrated by the splitting of the graph into two lines indicating the numbers of inoperable and operable cases. The terms "operable" and "inoperable" are hard to define, and their application must obviously depend upon the individual judgment of the surgeon in charge. "Inoperable" may be understood, however, to mean in general that no surgical treatment could hope to eradicate the disease, even locally; "operable," that there was a reasonable expectation of complete local removal by operation, though this has been interpreted somewhat liberally. In the present state of knowledge it is clearly of importance to maintain the somewhat artificial and arbitrary distinction between operable and inoperable cases. Few surgeons who have been accustomed to operate for carcinoma of the breast and have obtained a high survival rate in early cases will consent to use radium instead of operation, unless they can be satisfied that radium will give results at least as good. A comparison of results in operable cases must therefore be made available when a long enough time has elapsed.



The total survivals among the 149 patients treated to the end of 1929 is as follows:—

	Treated.	Alive.
Operable	108	101
Inoperable	41	22
Total	149	123

The survival rate is further analysed in the following table.

The survival rate among inoperable cases must of necessity be relatively low, though actually, considering that all these were patients whom surgery could not have helped, the survival rate is surprisingly high. Among the operable cases only five patients are dead out of 110 treated during four years, though it must be pointed out that more than half of these were treated a year or less ago.

It must not be supposed that every one of these patients has had radium treatment only, nor necessarily on only one occasion. Thus, in 13 patients a lump had been locally removed before the radium was inserted. Usually an interval of three or four weeks was allowed to elapse in order that sound healing might take place, and then the radium was inserted in exactly the same way as if the tumour was still there. Recurrence has taken place in only one patient, and this was successfully dealt with, so that this procedure does not seem to be absolutely wrong, though to be avoided if possible.

Table showing Analysis of Survival Rate.

—	Operable.			Inoperable.		
	Cases treated.	Now alive.	Without apparent signs of disease.	Cases treated.	Now alive.	Without apparent signs of disease.
1924 ..	—	—	—	1	1	?
1925 ..	—	—	—	6	1	1
1926 ..	3	1	1	3	3	3
1927 ..	7	6	3	7	4	4
1928 ..	29	26	13	11	5	0
1929 ..	69	67	39	13	8	0

In 13 patients a residual swelling has been locally excised some time after radium treatment had been completed. These patients form a group of relative failures, the excision having been undertaken because carcinoma was known to be still present, or owing to uncertainty as to the nature of a residual tumour. Some of these cases have already been referred to in describing the histology of tumours after irradiation, and it was mentioned that carcinoma was found to be still present in some of them. Nevertheless, of these 13 patients eight are alive and without signs of disease.

Three patients had already had a radical operation performed for carcinoma of the breast, and radium was inserted as a form of prophylactic treatment. All of these are free from signs of disease, though this cannot be ascribed with any confidence to radium!

X ray treatment after radium has been given to 11 patients. These were all relative failures, the X rays being given because of recurrences or an incomplete disappearance of the growth.

A total, therefore, of 109 patients have had radium treatment only.

Reference has already been made to the supposed occurrence of acquired insensitivity of carcinoma to irradiation as a result of repeated treatment. These remarks were founded on the experiences of the following patients: 23 had two treatments; 3 had three treatments; 2 had four treatments.

The following are characteristic examples of successful treatment.

A patient with a small scirrhous growth adherent to the chest wall was treated in May, 1925. Three months later the tumour had disappeared, and the patient is quite well over four and a half years after this single treatment. Another patient had a growth of moderate size dimpling the skin of the left breast; treatment was given in November, 1927, and four months later the lump was gone. Rather more than a year after treatment she proceeded to give its efficacy the severest conceivable test by becoming pregnant. Confinement, lactation, and nursing took place normally, and the patient is quite well two years after treatment. The presence of carcinoma in this patient was proved by section.

CAUSES OF OCCASIONAL FAILURE.

I do not wish to convey the impression that the treatment is never attended by real failure, though such cases have been surprisingly few, apart from the inevitable wastage of patients due to visceral or skeletal metastases, and to intercurrent disease.

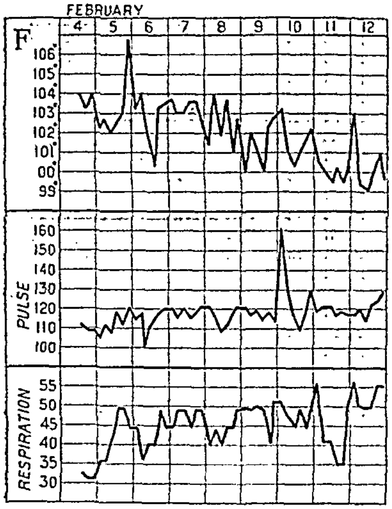
CASE 7.—Saw the parrot daily, and tried to catch it on one occasion, but did not actually handle it.

CASE 8.—Son of Case 7. Never entered the flats nor had any direct contact with the parrot.

A Second Fatal Case.

CASE 9.—Male, aged 60, had lived in China and Egypt 25 years ago where he is said to have had malaria and typhoid fever. Six years ago he developed carcinoma of the larynx which was successfully treated by radium. He purchased 8 parrots on Dec. 11th, 1929, and 2 budgerigars and 2 monkeys on the 24th. The parrots were wild, so it is possible that infective material was wafted to some distance from the cage. A parrot died on Dec. 26th, a love-bird about the 29th, another parrot on the 30th, and a third on Feb. 6th, 1930. The patient himself buried those birds which died before the onset of his illness. The daughter admits to picking up feathers of the bird which died on Dec. 26th; on Jan. 10th she developed a disease having the symptoms, signs, and course of pneumonia; yet with temperatures 103°–104° the pulse was 84–90, respirations 22–24.

CHART 6 (Case 9).



Clinical History.—On Jan. 22nd and the two following days the patient complained of headache in the evening on return from work. The incubation period is impossible to assess with certainty; it may have been as long as 28 days. On the 4th day he shivered; temperature found to be 104° F. Slight cough was present; sputum small in quantity, frothy, mucoid, never coloured. A little later, and for some days, the cough was often followed by vomiting which was also easily induced by inspection of the throat or the presence of a thermometer in the mouth. Headache was severe on the 5th and 6th days, and general aching of the body was also a complaint. There was no epistaxis.

When first seen by one of us with Dr. S. T. Harris on the 9th day of his illness the patient was flushed, but beyond the temperature of 103° F. a pulse of 90, and the rash, no physical signs could be found to account for his illness. The pulse was not dicrotic, and the knee-jerks were normal. He resented being kept in bed, and it is stated that at night he used to leave his room in search of food. On the 14th day he was admitted to St. Bartholomew's Hospital. The general tendency of the temperature in the succeeding days was to fall, and the pulse and respiration frequency to rise (Chart 6). Delirium, at first nocturnal, was present from the fourth night; in the earlier stages he moved his arms as though driving a car. By the end of the second week, though still able to recognise individuals for short periods, he was very talkative—a happy delirium in which correct sentences were used but without sensible context. Later, a low muttering delirium as he sank into the typical "typhoid state" in which death occurred on the 22nd day of the disease.

Rash.—On the 9th day, for 24 hours only; confined to the trunk, around the lower costal margin and flanks. Spots about 20 in number, 3 or 4 mm. in diameter, red-brown, circular or square, sharply defined, just raised, fading on pressure; more plaque-like and darker in colour than the classical "rose spot" of typhoid fever.

Other Physical Signs.—The spleen was not palpable, and there was no enlargement of superficial lymph nodes. The tongue was moist in the earlier stages, its surface covered with a white fur except at the edges; it became more dry and brown as the illness progressed. The throat was injected, but showed no exudation. The abdomen gradually became distended during the third week, but at no time was tympanites excessive. The bowels were constipated in the early stages; for two days after the intravenous injection of 5 c.cm. of 1/1000 perchloride of mercury he suffered from diarrhœa; the stools were pale in colour and offensive, but contained no macroscopic blood or mucus. Much flatus was passed. From the 16th day he was incontinent.

The pulmonary breath sounds at all times were weak, perhaps because of emphysema. During the second week rhonchi and fine râles were audible at the right base. About the 15th day similar signs developed at the left base with impairment of percussion note; it was only on the day before death that the breath sounds became bronchial, and then only in small areas on the left side. At no time was friction heard. The cough and quantity of sputum greatly diminished during the third week. There was some hiccough towards the end.

Clinical Pathology.—On the 9th day the white cell count was 7200 per c.mm. On the 16th day white cell count was 8800 per c.mm., and reds 5,100,000. Colour-index 0·8.

Blood Cultures.—9th day and 14th day in broth and in bile gave no growth. Agglutination: Serum failed to agglutinate in dilution of 1/25 to 1/250 on incubation at 55° C. for 24 hours *B. typhosus*, *B. paratyphosus* A and B, *B. aertrycke*. *Vomit* containing bile was cultivated; no organism of the typhoid or the salmonella groups was isolated. *Throat swab* yielded no hæmolytic streptococci, or any Klebs-Löffler bacilli. *Sputum* (17th day) was mucoid with a few purulent flakes. Films and cultures showed pneumococci, and a few streptococci of the salivary type. *Urine* contained a trace of albumin. No bacilluria or pyuria. *Stool* (10th day): Liquid brown material, faintly acid in reaction. Gram film showed coliform bacilli, streptococci and anaerobes in the usual proportions. An organism which did not ferment lactose was present in small numbers. It was not agglutinated by the patient's serum or by any type serum of the typhoid or salmonella groups.

Treatment.—The patient was treated on general lines as a case of typhoid fever. On the 15th day he was given intravenously 5 c.cm. of 1/1000 hydrarg. perchlor. in 600 c.cm. of saline. A rigor ensued in less than one hour, the temperature rising from 103° to 106·8°; in four hours it had fallen to 101°. No apparent benefit followed this pyrexial reaction. *Serum:* Though the daughter's illness was diagnosed as pneumonia it was thought possible she might have been a case of psittacosis. As the patient's condition was steadily worsening he was given 12 c.cm. of his daughter's serum intramuscularly on the 16th day, 18 c.cm. on the 20th day, 15 c.cm. on the 21st day, and 20 c.cm. on the 22nd day. No apparent benefit. The application of dry cups, followed by a linseed poultice, to the left base was without obvious effect on the pulmonary condition.

Morbid Anatomy in the Two Fatal Cases.

The striking changes in both fatal cases are in the lungs. The pleuræ have lost their lustre, and a thin layer of fibrinous exudate is present over the greater part of both lungs. This exudation can be peeled off without difficulty. Small hæmorrhages are present beneath the visceral pleura, particularly towards the base; there is no free fluid in the pleural cavity. The lungs are not greatly swollen and do not bear the imprint of the ribs. In the woman (Case 3), on the surface of the lung, chiefly in the lower lobes, are a number of bosses, dark red in colour, firm to the touch, varying in diameter from ½ to 2 inches. Immediately surrounding these areas is a narrow bright red belt, the whole having much the appearance of a lung containing a number of septic infarcts all of recent origin. On section (Fig. I., special plate) it is found that the slightly raised areas already referred to are areas of consolidation, reddish-grey in colour, and bounded by a deep red margin. Other similar areas are seen in the depth of the lung, the intervening parts of which are brownish-grey in colour and gelatinous in consistency. A small hæmorrhagic infarct is present in the right lower lobe. In the left upper lobe the consolidated areas are more grey in colour, and appear to be of longer standing than elsewhere. There is no breaking down of lung tissue, and no purulent secretion in the bronchioles though the trachea and main bronchi are injected and contain some muco-pus. The bronchial glands are swollen and firm.

In the man (Case 9), the upper two-thirds of the left lower lobe and the right upper lobe are for the most part solid. In both lobes are grey asbestos-like areas, mostly granular to the touch, surrounded by a bright red margin (Fig. II). Other areas sharply defined present a more structureless appearance like that of an ischæmic infarct or the "white pneumonia" of congenital syphilis. There is much gelatinous œdema, but no purulent exudation and no softening. The trachea and bronchi are injected. The bronchial glands are not enlarged. The spleen in both cases is slightly enlarged; congested but not soft. The other viscera show cloudy swelling and congestion. An intramuscular hæmorrhage of recent origin is present in the abdominal wall of Case 9. It is not at the site of a serum injection. The bowel contents are fluid, and in the cæcum are four small shallow acute ulcers, the peritoneum over which is natural.

The *histological study* of the changes in the lungs demands more detailed investigation. Yet the preliminary stage in the examination already shows certain peculiar features.

In both cases the main condition may be described as a broncho-pneumonia, the cytology of the alveoli in the actual areas of consolidation showing no unusual characters. Neighbouring areas of lung are œdematous. In addition there are small foci of suppuration and in some places there are areas of complete necrosis. In Case 3 (Figs. III. and IV.) one of these areas is at the periphery of the lung and the presence of a thrombosed artery at its apex suggests that it may be an infarct. However, thrombosed vessels are seen in other parts of the lung, without adjacent necrosis. A further peculiarity in this case (3) is the presence in the lung of plugs of coagulated material in many of the alveoli. These are of regular, circular, or oval shape, and contain no cells except shed alveolar epithelium bordering them. No structures exactly comparable with these have yet been seen in the second case.

General Remarks.

The study of the cases hitherto reported under the provisional name of psittacosis, together with these here recorded, makes the conclusion almost irresistible that there is a septicæmic form of disease in human beings closely associated in causative fashion with disease in parrots and kindred birds. This conclusion is borne out alike by the clinical features of the disease, by the peculiar morbid anatomical findings—especially in the lungs—in fatal cases, and by the evidence of contact, direct or indirect, with sick or dead parrots.

Amongst the clinical features in the series of cases here noted the prevalence of epistaxis during the early stage of the disease, the tendency to diarrhœa with collapse, and the special liability to pulmonary complications towards the end of the first week are noteworthy. If the cases are to be accepted as a group in which the infection is of the same order throughout, it is clear that the disease may be in some instances extremely severe, carrying a very grave prognosis, and in others quite mild. There is also some suggestion that age is a factor in prognosis, in that the severest cases have been in patients over 30 years of age. There appears to be no recorded case of a severe illness in a patient under 20 years of age. Case 8 in the present group, a boy of 11 years, was very mild, as was the case in a boy of 7 years, the youngest in Dr. A. P. Thomson's series of 21 cases.[1]

In considering the *differential diagnosis* the acuteness of the onset with headache, general pains, anorexia, and insomnia very naturally suggest influenza. In neither disease have we any diagnostic criterion either as regards physical signs, clinico-pathological findings, or bacteriological tests. Absence of leucocytosis marks both diseases, at all events in their early stage. Epistaxis or delirium occurring during the first few days should raise suspicion that the case is not influenza. The similarity between the diseases may obviously be so close that further knowledge can alone help us to decide how many cases labelled "influenza" properly belong to this more recently studied infection. Although it is no doubt true to say with Dr. Thomson that the outstanding features of psittacosis are consequent on the pulmonary involvement, it must be remembered that this is also true of the more severe cases of influenza. If, however, in a doubtful case, pulmonary signs appear during the first three days the diagnosis of influenza is the more probable. On the other hand, an influenza-like disease which persists for more than five days without pulmonary complications should lead to inquiries, *inter alia*, concerning sick birds. From the enteric group psittacosis is marked off in the main by its more abrupt onset, negative blood culture in the early days; the absence of an agglutination reaction in the second week, and the rarity in typhoid nowadays of pulmonary complications other than signs of slight bronchial catarrh. General tuberculosis will sometimes present a difficulty, but here again the onset is likely to be less acute, the pulse frequency raised more in proportion to the temperature, and the appearance of toxæmia, as expressed by the facies, anorexia, and delirium, less marked than in psittacosis.

In the matter of the incubation period of psittacosis no reliable evidence is afforded by a study of the cases here reported. They do suggest, however, that it is not less than ten days.

We desire to express our thanks to several of our colleagues—to Drs. James Maxwell, R. S. Johnson, and L. P. Garrod for pathological investigations; to Dr. E. R. Cullinan for his preliminary report on the histological appearances in the lungs; to Dr. E. L. Sturdee (of the Ministry of Health) for sundry communications; and especially to Dr. Desmond Urwick for his careful analysis of the group of eight cases recorded in the text, and his permission to make use of his notes.

PULMONARY ASBESTOSIS.

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ALTHOUGH asbestos and asbestos products have been used in industry for a long time, it is only during the last few years that pulmonary asbestosis has been recognised as a serious industrial disease.

Asbestos, which was known to the ancient world, is a silicate occurring in minerals in combination with iron, copper, calcium, or magnesium. It is quarried or mined in various parts of the world; Italy and the Mediterranean, South Africa, Rhodesia, Canada. In its natural state it occurs in strands of long silky fibres which are highly resistant to heat, strong acids, and alkalis. These masses are usually broken up into short lengths before exportation into this country. In this country the lengths are crushed and disintegrated and then either mixed with various substances for hardening into slabs, pipes, boards, &c., or carded, spun, and woven into various products like mats and mattresses, or used as an inert diluent or filling of a heat-resisting character. At certain stages in these industrial processes dust consisting of fine asbestos fibres is generated. When examined microscopically by dark-ground illumination the asbestos fibre gives the impression of a sharp, brittle metallic wire broken off at various angles and in different lengths, and, being highly refractile, has the appearance of the glowing filament of an electric bulb. These fibres can be found in the nose and mouth, and in the asbestos corns and minute skin lesions of the workers. On reaching the lung the fibres set up a pneumonokoniosis of a characteristic variety.

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[1] THE LANCET, Feb. 22nd, p. 396.

show subsidiary bosses on it or may be broken off altogether or splintered in small bits. The segments may be closely contiguous like those of a crustacean, or they may be separated by a clear interval, and they are not infrequently fragmented. They vary in size and may be rectangular or oval. Occasionally sausage-shaped forms of the asbestosis body without any constrictions are found. Also what appear to be early forms can be detected. These look like thickened fibres with a slightly bulbous head, and they often are of unusual length, rather suggesting that once the asbestosis body is fully formed it tends to get fragmented. The bodies do not stain with the ordinary aniline dyes, but can be faintly stained with the prussian blue reaction used for detecting iron in histological sections. They are resistant to antiformin and to weak acids, and we have found them, in sections, to resist weak decalcifying fluid for many days. We have also found them to resist desiccation and autolysis in sputum for at least a week.

Once seen the asbestosis body can be readily recognised, and we know of no other substance found in human histology with which it can be confused.

Suggested Classification of Stages of Pulmonary Asbestosis.

Pulmonary asbestosis falls into group B [1] of occupational diseases of Bridge's classification.[11] Three stages can be defined: (1) the presence of asbestos fibres in nasal secretion or in the mouth, merely indicating exposure but not necessarily disease; (2) the presence of asbestosis bodies which is a sign of a tissue response to the infecting dust; (3) the typical symptoms, signs, and X ray appearances which are, in addition, clear evidence of the disease irrespective of the finding of asbestosis bodies.

Obviously (1) is no evidence of disease, but we can accept (2) as a sign that disease is present. In the absence of sputum diagnosis must be made on (3) alone. There remains, of course, the difficulty of a patient with pulmonary fibrosis of childhood origin, subsequently becoming employed in an asbestos factory. We consider the radiogram would be sufficient to distinguish this type of case from true pulmonary asbestosis.

Lastly, there is the question of pulmonary tuberculosis as a complication. Does the occupational disease light up quiescent tuberculosis or does tuberculosis become implanted on pulmonary asbestosis as a terminal event? It is impossible to decide this question, but it is worth while noting that when pulmonary tuberculosis does occur in these cases it is liable to be of an anomalous type.

We are indebted to the Medical Staff of the hospital for permission to use their cases, to the Staffs of the Radiological and Pathological Departments, and last but not least to Dr. C. Leonard Williams, medical officer of health for Barking, for much assistance throughout.

References.

1. Murray, H. M.: Quoted by Cooke, W. E., Brit. Med. Jour., 1927, ii., 1024.
2. Cooke, W. E.: Ibid., 1927, ii., 1024.
3. McDonald, Stuart: Ibid., 1927, ii., 1025.
4. Simson, F. W.: Ibid., 1928, i., 885.
5. Stewart, M. J.: Ibid., 1928, ii., 509.
6. „ and Haddow, A. C.: Jour. Path. and Bact., 1929, xxxi., 172.
7. Gloyne, S. R.: Tubercle, 1929, x., 404.
8. Wood, W. Burton: Ibid., p. 353.
9. „ „ and Page, D. S.: Ibid., p. 457, and 1930, xi., 157.
10. Haslam, J. F. C.: Recent Advances in Preventive Medicine, London, 1930.
11. Bridge, J. C.: Brit. Med. Jour., 1929, ii., 203, 1143.

YORKSHIRE REFRACTION HOSPITAL. — This institution is at present housed in temporary premises in Leeds owing to the difficulty of obtaining a more suitable building, but the Yorkshire Optical Society is now hoping to raise £30,000 for the erection of its own hospital. It has been equipped and maintained hitherto at the cost of medical men and opticians. The professional staff is unpaid, and at present the hospital is open one afternoon and five evenings a week, which does not meet the demand.

SHEEP-DIPPING AND THE SHEPHERD.

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AND
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SHEEP-DIPPING is a compulsory procedure, and practitioners in rural areas are acquainted with abdominal, cutaneous, and nerve troubles that have been attributed to the absorption of arsenic during the process. In the case we are now recording the symptoms were suggestive of arsenical or ptomaine poisoning and the medical attendant did not feel justified in giving a death certificate. We were asked to carry out the pathological and chemical investigations, and our findings may be found useful for future reference.

The sheep dips in common use are generally made up in the form of a powder containing about 20 per cent. of arsenious oxide, mixed with sodium carbonate and finely ground sulphur. When prepared according to the directions, the dipping solutions contain 0·2 per cent. of soluble arsenic. It is, however, said to be a solution of arsenic trioxide in sodium di-hydrogen arsenate, and its toxicity to be about one-half of what it would be were the arsenic trioxide dissolved without the addition of an alkali.

The actual details of the sheep-dipping vary in different parts. The conditions under which the deceased man was reported to have worked were as follows. When 500 sheep were to be dipped, 35 two-pound packets of sheep dip were obtained from the estate office stores. The ends of these were slashed open with a knife. The contents of three packets were emptied into a two-gallon bucket; water was added and the powder and lumps dissolved with the aid of a stick. The mixture was then tipped into a 200-gallon bath. The procedure was repeated until the necessary density of the bath was attained. As each packet was emptied it was placed on the ground. When a heap of packets had collected they were burned. One man drove the sheep through a trap-hurdle into the bath; another guided their way through the bath to its exit by means of pronged sticks. The dripping sheep drained off for half an hour in one pen, and were then transferred to another pen for further drying. If the day was hot the sheep dried off in 2–4 hours; if it was dull and showery 8–24 hours were required. The dried sulphur-arsenic solution could be seen and felt on the sheep for several days. At the close of the day's dipping, the arsenical bath was left overnight, and later made up again to the required volume and strength by the addition of more "dip" powder. If the bath was not wanted again the residue was washed out into drains. When the dip solution was first prepared a yellow scum appeared on the surface. This was removed by a broom. The broom, after use, was swilled out and left by the bath for future use. None of the men wore overalls, gloves, or special garments. There were no printed instructions about the precautions the men should take in order to protect themselves from the solution, but they were told individually not to allow any of the fluid to get on to any sores or into their mouths. They were enjoined to wash their hands before eating. Water was provided for the purpose, but there was neither soap, nailbrush, nor towel.

At this farm there was a man, aged 48, who had been a shepherd since boyhood. On June 27th, 1929, he and one helper dipped 125 sheep. The bath had been prepared for him by the farm bailiff. The dipping of the sheep took one hour. On July 14th he got up early to look after his sheep and had for breakfast some fried beef prepared from some ribs of beef supplied the previous day. The remainder of the beef was then put aside in a wooden cupboard in the wooden hut he lived in, until Tuesday, July 16th, when it was "stewed up," and later eaten by other members of the household. In addition a part of a rib was given to one of his dogs.

The outside shade temperature during the days was as follows:—

	Maximal.	Minimal.
July 11th–12th	75° F.	62° F.
,, 12th–13th	78° F.	55° F.
,, 13th–14th	82° F.	59° F.
,, 14th–15th	84° F.	61° F.

The man had dinner with the family on July 14th, and they all had steak and kidney pudding. On Monday, July 15th, he could not go to work, owing to afebrile sickness and diarrhœa. This continued until the 17th, when his medical attendant was sent for. The doctor failed to find any outstanding signs on physical examination, and naturally regarded the case as ordinary summer diarrhœa. The next day, however, there were indications of cardiac collapse, and the man died on July 18th at 7.30 P.M. Meanwhile the dog appeared to be very ill, and it died at noon on the same day. It was promptly buried. None of the other members of the family was affected.

Autopsy.

Under the circumstances the coroner was informed. He ordered a post-mortem examination. This was carried out 15 hours after death. The chief findings were as follows: There were no rashes, but there were eight small pustular areas on the lower limbs. The stomach, duodenum, and jejunum showed widespread redness and swelling, with numerous small hæmorrhages. There were no ulcers. The lymphoid areas were swollen generally, but the lymph glands were not much enlarged. The ileum and colon were slightly red and swollen. The liver was not enlarged or fibrosed; it presented early fatty changes. Except for intense congestion the other organs were free from naked-eye morbid changes.

Microscopical Appearances.

The stomach and small intestines showed catarrh and small hæmorrhages. The liver was hyperæmic. Fatty changes were widespread, but the central zone of the lobules was not atrophic or fatty. The veins were distended, but there was not any evidence of chronic vascular damage. Interstitial tissues were not increased. The sinusoids were dilated generally, and contained many polynuclears and monocytes. Kupfer's cells were certainly swollen, but they were free from fatty metamorphoses. There were no signs of biliary obstruction or of jaundice. The heart did not present the features associated with fatty degeneration. The blood-vessels were congested, but there were no small hæmorrhages. The myocardial cells showed cloudy swelling, but the striæ were still easily demonstrated. The interstitial tissue was normal. The kidneys presented early post-mortem changes, but there was no change in the circulatory or interstitial tissues. The cerebral vessels were free from hæmorrhages, from perivascular infiltrations, and from atheroma. There were early calcification changes in the choroid plexus. The nerve-cells and axons were normal. The skin abscesses were staphylococcal in type. The blood became "putrid" in three days.

Numerous loopfuls of the contents of duodenum, jejunum, colon, and spleen were transferred to tubes of lactose broth. Twenty-four hours later all the non-lactose fermenters were isolated on selective media. From each of the areas mentioned there was isolated a bacillus which satisfied all the cultural criteria necessary for its identification as *aertrycke*. In addition, it agglutinated to the full titre of an *aertrycke* serum, failed to agglutinate with a paratyphoid B serum, and absorbed fully the agglutinins from the *aertrycke* serum.

The Dog.

After the dog had been buried for 36 hours it was exhumed. Putrefactive changes were well advanced, and histological features were indistinct. Gross pneumonic and abdominal, or traumatic changes could, however, be excluded. In spite of the general distribution of proteolytic and gas-forming bacteria, an attempt was made to isolate pathogenic organisms. Cultures were made as in the case of the man. An organism was ultimately isolated from the spleen and intestines which gave identical reactions to those of the strain obtained from the organs of the deceased man, and according to its serology was identified as an *aertrycke* bacillus.

Chemistry.

The tissues of both man and dog were examined for the presence of arsenic with the following results:—

The figures were obtained from the averaged materials. Previous experience had shown that with organs such as liver and kidney a total content could not be calculated from the results of the analysis of one portion. It was deemed necessary to use the whole organ or to take pieces from several parts of the organ and mince and mix them thoroughly. All the estimations were made by Marsh and electrolytic Marsh methods.

Shepherd.	Arsenic tri-oxide.	Shepherd.	Arsenic tri-oxide.
Stomach contents	None.	Kidneys	0·053 gr.
Stomach wall	None.	Brain	Trace.
Small intestine	None.	Spleen	Trace.
Small intestinal wall	None.	Sternum and ribs	None.
Large intestine contents	0·009 gr. in 87 g.	Pubic, thoracic, and scalp hair	None.
Large intestinal wall	0·011 gr. in 686 g.	Skin from abdomen	None.
Liver	0·148 gr.	Nail from toe	None.
Lungs	0·005 gr.	Urine (bladder empty).	
Heart	0·002 gr.		

gr. = grains; g. = grammes.

Dog.—Contents of liver: No arsenic tri-oxide.

The history of the case showed that there was access to sheep dip arsenic about 20 days before death. Detailed inquiry into the man's habits yielded negative results as to intake from other sources, and fish formed a negligible fraction of the household dietary. The absence of arsenic from the stomach and small intestines may be ascribed to the vomiting and diarrhœa of the early days of the illness. But, on the other hand, the arsenic contents of the thoroughly cleaned wall of the alimentary tract and that of the colon suggest excretion following absorption. The negative findings in bone, hair (from head, thorax, and pubis), nails and skin, are somewhat against a repeated or chronic intoxication. Yet if it is assumed that only one dose was taken, the major portion of the arsenic should have been excreted within 20 days." The general blood stream, according to the arsenic contents of brain, lungs, spleen, was carrying a minute amount. If a similar quantity had been carried daily for 20 days it would constitute a considerable addition to the hepatic residue, and point to the probability of an original intake not far short of a minimal human toxic dose. The morbid anatomy of the organs supports this inference. While the metal had caused a certain amount of hepatic damage, it had not broken down entirely its antitoxic capacity, for the arsenic had been transmitted to the general circulation only in small instalments. Its concentration in the blood stream was apparently insufficient to damage the walls of the smaller vessels or to effect a necrosis of the parenchyma of the vital organs. The cardiac and nerve-cells were practically unaltered. The picture was entirely different from the poisonings where the liver has been so damaged that the entering arsenic fails to be arrested and passes almost unrestrained to the systemic vessels and cells.

It may be that the condition of the liver is the factor which finally determines the distribution of arsenic in the outlying tissues, and that the finding of the metal in the skeletal and epidermal areas is a measure of the damaged hepatic functions. When the liver similarly ceases to protect the myocardial cells, then there must enter a further factor—viz., that of slowed circulation, first peripheral and later central. The elimination of the arsenic is then lessened and delayed, and organs other than liver tend to store increasing amounts of the metal. In this case the circulatory organs were normal up to five days before death. Heart failure became evident only about ten hours before death. Hence it would be impossible that there would be any perceptible hold-up of the arsenic from progressive stasis.

Had the fatal *aertrycke* infection not intervened it is possible that the residue of the arsenic might have been eliminated in time and the hepatic damage have been compensated. In such a case an examination at a later date might have yielded negative results. Clinically, the arsenical intake did not give rise to any symptoms, and it was not possible to obtain any previous history of arsenical action. As, however, it seems probable that arsenic was ingested during the last sheep-dipping, it is very likely that similar intakes had happened before. Taking into consideration the quantity of arsenic in the tissues it is permissible to assume, perhaps, that the original dose would have caused severe damage in a susceptible individual, and that even in those less sensitive it would call for the assumption of some degree of acquired tolerance. Tolerance for arsenic implies lessened susceptibility or insusceptibility of the tissue cells for arsenic. It is manifested, presumably, by minimal damage to liver and other "affinity" cells and elimination by the most direct routes. In this instance the wall of the large intestine and the kidney formed the chief, if not the only pathways. Further, the cardiac and renal tissues did not show the usual "arsenical" toxic changes. They were apparently protected by the liver cells, which themselves suffered but slightly. In addition, the blood content in the spleen was slight, while the bones and the skin and the hair were arsenic-free, although excretion of arsenic was being carried on by other channels. Histologically, the blood apparatus did not show any signs of chronic passive hyperæmia, and capillary hæmorrhages were not present in heart or brain.

Table showing Arsenic Output and Action in a "Sensitised" Individual.

Days.	Time.	Arsenic intake, grains.	Urine: Arsenic output, grains.	Clinical.
1.	9·30 A.M.	0·1802	—	—
	10·30 A.M.	—	None.	—
	12 noon.	—	0·004	—
	4 P.M.	—	0·0046	—
	10 P.M.	—	0·0034	—
2.	9 A.M.	0·1802	—	—
	7 A.M.	—	0·0030	—
	8 P.M.	—	0·0215	—
3.	8 A.M.	—	0·0119	Slight nausea.
	9.30 A.M.	0·1802	—	—
4.	9.30 A.M.	0·1802	0·0275	Headache; nausea; loss of control of legs.
5.	—	—	0·0283*	Burning sensation in throat.
6.	—	—	0·0624	Warmth and sense of fullness in chest and abdomen.
7.	—	—	0·0297	Nausea and burning absent. Diarrhœa present.
8.	—	—	0·0192	Diarrhœa.
9.	—	—	0·0129	Severe pains right foot and knee.
10.	—	—	0·0125	Twinges in left knee and forearm.
11.	—	—	0·0122	"Steppage" gait.
12.	—	—	0·0028	—
13.	—	—	0·0012	—
14.	—	—	0·0012	Gradual decrease of neuritic symptoms.
15.	—	—	0·00018	—
16.	—	—	0·00058	—
17.	—	—	0·00097	—
18.	—	—	0·00009	—

* Twelve hours' urine only. On the average for 24 hours, the quantity should be over 0·0400 grains.

Arsenic Contents of Hair from a "Sensitised" Patient.

Oct. 7th. Hair cut. No arsenic.
Oct. 8th–12th. Arsenic intake 0·72 grains.
Nov. 12th: Hair contained 0·005 } Mg. of arsenic per gramme of hair.
Dec. 17th: „ „ 0·0004 }

These findings, therefore, raise the question whether tolerance lies in a developed cellular anti-affinity and its absence in the permeability of capillaries extending later to an actual damage. It is beyond a doubt that in cases of homicidal or experimental arsenic poisoning, or even during arsenical medication, the skin and hair may contain considerable quantities of the metal. It seems as if in this case the absence of arsenic from its usual seats may properly be ascribed to a tolerance. The salmonella infection which terminated the case may have hastened slightly the excretion of arsenic by the associated active hyperæmia and, crosswise, its course may have been accelerated owing to the absence of a vigorous defence. The death of the dog from the same infection, and apparently within a shorter period, rather suggests, however, that the infection was too massive to be affected by any slight alteration in resistance.

An opportune case of arsenical hypersensitiveness suggested some further considerations.

A patient who had suffered from psoriasis for many years was accustomed to take gr. 0·27 of arsenic with impunity. His last attack and last dose of arsenic was in 1926. He was now given gr. 0·18 of arsenic for four consecutive days. Symptoms of nausea appeared on the third day; pharyngeal irritation was evident on the fifth day; diarrhœa occurred on the seventh day; and neuritis on the ninth day. Arsenic was voided in the urine passed two and a half hours after the first dose. The output gradually increased up to the sixth day. The day excretion varied but slightly from that of the night. From the 6th to the 12th day there was a gradual fall, and then a sudden decrease. On the 18th day the urine was practically arsenic-free, although the arsenic contents of the hair on the 35th and 70th days point to a continuous circulation and elimination of minute amounts. About 36 per cent. of the total intake of arsenic was voided in the urine during 18 days, the larger proportion being excreted during the first 11 days.

The presence of arsenic in the urine so soon as two and a half hours after ingestion, and the early onset of mucosal and nerve manifestations without serious damage to heart, liver, and kidney, suggest a rapid passage through the liver, and an increased permeability of the general capillaries. It may be that the susceptibility towards arsenic is mainly a question of endothelial "allergic" changes, and that tolerance is the expression of specialised endothelial selectivity.

Summary.

1. The death of a shepherd was preceded by symptoms indistinguishable from arsenical poisoning. Considerable amounts of arsenic were found post mortem in various organs. Elimination was proceeding via the kidney and the wall of the large intestine, but not by skin and hair. 2. Death was proved to be due to an infection by *aertrycke* bacilli. One of the shepherd's dogs died from the same cause. 3. It is suggested that, through the ease of occupational intake of arsenic, a tolerance had been established. Such tolerance seems to be associated with certain histological appearances and a distribution of arsenic differing from those of homicidal poisoning. 4. The supervision of those engaged in handling commercial solutions of arsenic might be more precise. Workers vary in their susceptibility to arsenic, and a dosage which may evoke tolerance in one individual may damage another permanently.

References.

Althausen, T. L., and Gunther, L.: Jour. Amer. Med. Assoc., 1929, xcii., 2002, with many references.
Willcox, W. H.: Brit. Med. Jour., 1922, ii., 118.
Willcox, W. H., and others: Trans. Med. Legal Soc., London, 1929, xxiii.

HOSPITAL COSTS.—In Wrexham War Memorial Hospital last year the average number of beds in daily occupation was 91·75, and the average cost per occupied bed was £131 7*s.* 9*d.*, a reduction of 1*s.* 7*d.* Each in-patient cost £9 4*s.* 10*d.*, a fall of 13*s.* 6*d.*, and each out-patient (5431) 6*s.* 0¾*d.*—Acton (Middlesex) Hospital received 1186 in-patients who stayed an average of 13·88 days each, and their weekly cost was £3 5*s.* 1*d.*, an increase of 2*s.* 2*d.* on the preceding year.—At the Royal Devon and Exeter Hospital the cost per occupied bed (3481 in-patients) was £128 4*s.* 10*d.*, an increase of 7*s.* 10*d.*

SUSSEX PROVIDENT SCHEME.—In the first year of this scheme (1921) the sum of £332 was distributed among the various hospitals and authorities coöperating with it. In 1929 the figure was over £13,000. A new feature of the scheme is the inclusion of the Queen's nurses. Owing to the overcrowded state of all hospitals, patients are discharged as soon as possible, but many still require dressings, and under the new arrangement these can now be done by the Queen's nurses in the homes of the patients. The subscription for this is but an extra 2*s.* 6*d.*, and to show how welcome it is over 700 subscribers have already joined this section.

Clinical and Laboratory Notes.

THE DURATION OF YELLOW FEVER IMMUNITY.

By Edward Hindle, Sc.D. Camb.,
BEIT MEMORIAL FELLOW IN TROPICAL MEDICINE.
(From the Wellcome Bureau of Scientific Research.)

It is well known that recovery from an attack of yellow fever is followed by the development of a high degree of immunity, and it has generally been assumed that this immunity is of long duration, since cases of reinfection are extremely rare, but hitherto very few direct experiments bearing on this subject seem to have been recorded.

Theiler and Sellards,[1] in 1928, tested the protective value of convalescent serum collected in Brazil about three and a half months after an attack, and subsequently stored for about two years in the ice-chest, and found that the sera of seven out of nine patients protected monkeys against infection with an African strain of the virus. Hudson, Philip, and Davis[2] last year recorded similar experiments also made principally with the object of showing the identity of the Brazilian and African strains of yellow fever. Their results indicate considerable variations in the degree of protection conferred on monkeys by the inoculation of convalescent serum from different individuals. The sera of eleven patients who had recovered from the disease in West Africa, when inoculated into rhesus monkeys, protected them against lethal doses of a West African virus, but in every case less than two years had elapsed between the attack of fever and the date when the blood was collected. When longer periods had elapsed, as in the case of sera from South American patients, in some instances the protective value seems to have disappeared. The serum of Case 5, whose blood was collected approximately nine years after the attack, failed to protect monkeys in doses of 1·0 c.cm., and 0·1 c.cm. respectively; whilst the serum of Case 6, with a seven years' interval, protected in doses of 1·5 c.cm and 1·0 c.cm. respectively, whilst 0·1 c.cm. failed to protect. When sera of comparatively recent cases were tested effective passive immunity was conferred on monkeys against lethal doses of the virus.

It will be seen that the results of these experiments suggest that immunity may gradually disappear, but it should be noted that these sera had been collected in Brazil and subsequently transported to West Africa, so that considerable periods had elapsed before they were tested, during which they were exposed to varying conditions (e.g., temperature).

Through the kindness of Dr. A. Breinl, I have recently had the opportunity of testing his blood. He suffered from a severe attack of yellow fever in Manáos, Brazil, during 1905, since when he has never visited any regions where the disease is endemic. Four c.cm. of his citrated blood were mixed with 0·05 g. of the liver of a yellow fever monkey infected with an African strain of the virus, and also with 0·5 c.cm. of the blood of another infected monkey collected on the second day of fever. This second monkey was infected with a Brazilian strain of yellow fever. The mixture was at once inoculated intraperitoneally into a rhesus monkey. This animal showed no rise in temperature or any other signs of infection, whilst a control animal inoculated with 0·05 g. of the infected liver used in the experiment died of yellow fever four and a half days later. The experiment was repeated with a second monkey, which received an injection of 1 c.cm. of the patient's blood and immediately afterwards 0·05 g. of liver of a *monkey infected with an African strain of the* virus. This second monkey also showed no signs of infection.

The results show that immunity following an attack of yellow fever may persist for at least 24 years, and that after this period the blood is still capable of producing passive immunity in monkeys. Moreover, the blood protected monkeys against both African and Brazilian strains of yellow fever. The results of this experiment, therefore, confirm the generally accepted view that recovery from yellow fever is followed by a lasting immunity, and also furnish additional evidence as to the identity of the West African and Brazilian strains of this disease.

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[1] Theiler, M., and Sellards, A. W.: Ann. Trop. Med. and Parasit., 1928, xxii., 449.

[2] Hudson, N. P., Philip, C. B., and Davis, G. E.: Amer. Jour. Trop. Med., 1929, ix., 1 and 223.

A CASE OF GLUTEAL ANEURYSM.

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A man, aged about 45, a native of the Teso tribe, complained of pain and swelling in the right buttock. He was admitted to the Freda-Carr Hospital on Oct. 11th, 1929.

He had four wives and ten children, four by one wife and six by another. None of his wives had had any miscarriages. One of his children died at the age of 15 years, all the rest being still alive and healthy. He stated that he had had syphilis when a small boy, by which he meant that he had developed a rash on his trunk and arms without involvement of his penis. Apart from this he had always been in good health. He had never had any ulcers or sores anywhere on his body, and no history of injury to his buttock could be elicited. He stated that his symptoms started one month before admission, when he had begun to notice slight swelling and pain in his right buttock. The swelling rapidly increased in size, and the pain, which was continuous in character and radiated down the back of his right leg, became more severe.

Examination in Hospital.

He was a tall, thin man, and had a temperature of 99·6° F. The walls of his arteries were somewhat thickened. There was no enlargement of his heart, and I could find nothing abnormal on examination of his cardiac and respiratory systems. His urine contained no albumin or sugar. His knee-jerks and ankle-jerks were normal, and his pupils reacted to light and accommodation. There were no ulcers or scars over his tibiæ or other signs of syphilis. The whole of his right buttock was enormously swollen, and a heaving pulsation, expansile in character and involving the whole buttock, could be both seen and felt. The tumour was tense, tender, and incompressible, and deep fluctuation could be readily elicited. A marked systolic thrill could be felt by the hand half an inch behind the tip of the great trochanter. On auscultation a loud, harsh, systolic bruit was heard all over the buttock, most marked at a point half an inch behind the tip of the great trochanter. Firm pressure on the abdomen at the junction of the upper and middle thirds of a line drawn from a point half an inch below and to the left of the umbilicus to a point midway between the anterior superior iliac spine and the symphysis pubis on the right side—i.e., over the origin of the right internal iliac artery—obliterated the pulsation and systolic bruit in the tumour. Pressure over the common femoral artery had no effect. The enormous size of the tumour can be gathered from a study of the following measurements:—

	R. ins.	L. ins.
Anterior superior iliac spine to ischial tuberosity	15	12
Iliac tubercle to ischial tuberosity	16	11
Posterior superior iliac spine to ischial tuberosity	12	8¼
Outer margin of anus to tip of great trochanter	12	8¼

R. and L. = Right side and left side; ins. = inches.

I inserted a fine needle into the tumour. It was felt to pass through a hard outer wall, after which a sudden diminution of resistance occurred. The syringe filled with blood, the pressure within the tumour rapidly forcing up the piston. A firm bandage was applied, the foot of the bed raised, and the patient cautioned not to move.

Operation.

A diagnosis of aneurysm of the sciatic artery was made owing to the position of the thrill and maximum bruit. I considered that it would be quite impossible to ligature this artery, the enormous size of the aneurysm rendering puncture inevitable, and decided to ligature the right internal iliac artery.

On the following day, Oct. 12th, the patient was writhing with pain and begged for the operation. The swelling had still further increased in size and was more prominent. The skin over the tumour was shiny and, as the aneurysm was obviously on the point of bursting, the preparation of the operating theatre was hastened. The bladder was emptied by a catheter. An anæsthetic of chloroform and ether was administered, and the patient placed in the Trendelenburg position. A mid-line incision was made from the umbilicus to a point about one inch above the symphysis pubis, the two recti were separated, and the peritoneal cavity was opened. Obliteration of the pulsation and systolic bruit in the aneurysm by pressure of a finger on the right internal iliac artery was confirmed. While an assistant confined the intestines and great omentum to the upper part of the abdomen by means of a strip of gauze, the posterior parietal peritoneum over the artery was carefully divided for a distance of one inch, and the cut edges dissected up on each side. The right ureter having been dissected away from the anterior surface of the artery, the sheath of the latter was picked up with dissecting forceps and incised with a scalpel. The artery was then ligatured according to the method which Prof. A. W. Sheen prefers for occlusion of the innominate artery. Two strands of stout silk were passed beneath the vessel at a distance of about half an inch from each other, the aneurysm needle being passed from the medial to the lateral side inside the arterial sheath. The first turn of a reef-knot was tied in the proximal strand, and tightened until pulsation had ceased in the artery beyond. The distal strand was then completely tied by a reef-knot, and finally the second turn of the proximal ligature completed. The posterior parietal peritoneum was sutured over the artery with a continuous catgut suture, and finally the anterior abdominal wall closed in the usual way.

For two days after the operation the patient appeared to be progressing favourably, but on the third day, Oct. 15th, he suddenly developed the symptoms and signs of acute dilatation of the stomach. He vomited profuse quantities of bile-stained watery fluid at frequent intervals, on one occasion bringing up about half a gallon of liquid, and became extremely thirsty. He was most comfortable when lying on his left side. His temperature was 97° F. and his pulse became very rapid and weak. The epigastric region was visibly pushed forward by the distended stomach and was tympanitic on percussion. No peristalsis was visible and there was no rigidity of the abdomen. All food and water were immediately forbidden for 42 hours, a special attendant being placed on night duty to see that nothing was taken by mouth. At 11.30 A.M. pituitary extract 0·5 c.cm. was injected subcutaneously and a drachm of sodium bicarbonate in an ounce of water was given by mouth. At 4 P.M. a subcutaneous infusion of 16 oz. of normal saline was given in two portions into the left flank and right axilla respectively. The pulse was only just perceptible, though owing to its thickened wall the radial artery could be easily rolled under the finger. Vomiting and hiccup were very troublesome, and the brow was covered with a cold sweat. At 6 P.M. camphor gr. 1 in olive oil ♏ v. followed by ½ c.cm. of pituitary extract were injected without producing any recognisable change in the patient's condition. An intravenous infusion of 14 oz. of normal saline containing 6 per cent. of gum arabic was administered, and was followed by a slight though definite improvement in the pulse, which, however, was still barely perceptible.

On Oct. 16th we were surprised to see the patient still alive. His pulse was about the same. He was still vomiting though not bringing up such large quantities of fluid. He still had a distressing hiccup, and complained of great thirst. At 9.30 A.M. 10 oz. of the gum saline were given intravenously, and were followed by a very marked and permanent improvement in the pulse. Vomiting ceased and did not again recur. Strychnine hydrochloride gr. 1/30 was injected hypodermically. At 11.30 A.M. 10 oz. of 7 per cent. glucose in normal saline were introduced into the rectum and retained. A mixture containing 1 dr. of bismuth oxycarbonate, 20 gr. of sodium bicarbonate, and 1 oz. of water was ordered three times a day. At 3.30 P.M. another intravenous infusion of 18 oz. of gum saline was administered with great benefit to the patient, the pulse being almost normal in character. At 6 P.M. 10 oz. of 7 per cent. glucose in saline were given rectally.

On Oct. 17th he no longer complained of hiccup, and his pulse was normal. It was decided to allow his small quantities of fluid by mouth, and he was therefore given 2 oz. of equal parts of milk and water every two hours. On the 18th he took milk, soup, jellies, custard, and rice in small quantities every three hours. On the 19th he was allowed normal diet.

Immediately after the operation all pain and tenderness in the buttock had markedly diminished and by the third day, Oct. 15th, had almost disappeared.

On Oct. 19th he complained of no discomfort, nor was there any tenderness on palpation. The aneurysm was no longer tense, and the shiny appearance of the skin had vanished. The buttocks were flabbier on palpation, but fluctuation could still be elicited.

On Oct. 21st a comparative measurement of the two gluteal regions was as follows:—

	R. ins.	L. ins.
Anterior superior iliac spine to ischial tuberosity	12	11½
Iliac tubercle to ischial tuberosity	14	11
Posterior superior iliac spine to ischial tuberosity	9	8
Outer margin of anus to tip of great trochanter	11½	8½

On Oct. 20th a needle was inserted into the aneurysm. No fluid could be aspirated, but a few small particles of clotted blood were drawn into the syringe. On the 28th the right buttock appeared quite normal on palpation, except for slight hardness over an area half an inch in diameter just behind the tip of the great trochanter. On Nov. 1st, 19 days after the operation, the two buttocks appeared to be similar in size, and an examination of the right side revealed no trace of any hardness or other abnormality. A month later, on Dec. 2nd, an examination revealed the following measurements:—

	R. ins.	L. ins.
Anterior superior iliac spine to ischial tuberosity	10½	11
Iliac tubercle to ischial tuberosity	10	10½
Posterior superior iliac spine to ischial tuberosity	7½	8
Outer margin of anus to tip of great trochanter	8	8½

There was wasting of the right gluteal muscles, thus accounting for the smaller dimensions on this side. Apart from the fact that the patient developed a lobar pneumonia of a mild type involving the base of his left lung, which began on Oct. 26th and terminated by lysis, and that the abdominal incision was slow in uniting—presumably owing to deficient vitality of the tissues, but it had completely closed by Dec. 4th—there were no other complications. He was discharged on the 9th in a perfectly healthy condition.

The interesting points about this case are as follows:

1. The enormous size of the aneurysm and its rapid cure by ligature of the internal iliac artery, though undoubtedly the sluggish circulation which accompanied his gastric condition contributed towards the coagulation of blood.

2. The markedly beneficial effect on the acute dilatation of his stomach of a combintaion of intravenous gum saline infusions with the restriction of all food and fluid by mouth.

I should like to thank Dr. E. V. Hunter, who gave the anæsthetic for the operation and administered the intravenous infusions, for his valuable advice with regard to this case.

LOBAR PNEUMONIA ASSOCIATED WITH OLD MALUNITED FRACTURE OF RIBS.

By H. A. Dunlop, M.B., M.R.C.P. Lond.,
MEDICAL REGISTRAR, WESTMINSTER HOSPITAL;
AND
M. Kokia, M.R.C.S. Eng.,
HOUSE PHYSICIAN TO THE HOSPITAL.

A BOOTMAKER, aged 58, walked into Westminster Hospital on Dec. 31st, 1929, complaining of breathlessness and swelling of the feet.

The dyspnœa was an old symptom, for the patient could not recall a time when he had been free from it, but during the three weeks immediately before admission it had been markedly aggravated. The swelling of the feet was of three weeks' duration. There was a slight cough, but no pain in the chest; nor had there ever been hæmoptysis. The patient had for a long time drunk heavily. No history of antecedent lues or rheumatism was elicited.

The patient was obese, cyanosed, and extremely dyspnœic. He was conscious, but somewhat confused and difficult to interrogate. The temperature was 95° F., the pulse-rate

76 per minute, and the respirations 30 per minute, deep in character, and laboured. The pulse was feeble, but of less volume in the right upper limb than in the left. The blood pressure was 100/40 mm. Hg in each arm. The heart sounds were inaudible. The right side of the chest, especially the upper part, was much flattened and almost immobile. There was dullness over the whole of the right lung, where also the breath sounds were very feeble. Adventitious sounds—rhonchi and bubbling râles—were heard over both lungs. The left side of the chest was hyper-resonant, and the superficial cardiac dullness much diminished. The abdomen was distended; there was no shifting dullness or fluid thrill. The liver was not felt. The ankles were œdematous. The small quantity of urine passed contained much albumin.

The diagnosis was one of heart failure complicating some lesion of the right lung. The flattening of the chest suggested an old lesion, but the absence of chronic cough or sputum seemed to make this unlikely. The sputum was free from tubercle bacilli.

The man died from cardiac failure 36 hours after admission.

Post-mortem Appearances.—The flattening of the chest was seen to be due to old malunited fracture of the right upper ribs from the second to the sixth inclusive. There was no bony union between adjacent ribs, but the inner aspect of the thoracic wall was the seat of a dense mass of fibrous tissue extending into the root of the neck. The subclavian artery was entangled in and compressed by this massive cicatrix, and its lumen much diminished. The ribs were impalpable from without on account of the thick subcutaneous tissue. The right lung showed lobar pneumonia. The upper and middle lobes were in a condition of red hepatisation, the lower lobe being moderately congested and œdematous. The left lung was emphysematous and œdematous. The heart was dilated and fatty. The liver was congested, fatty, and cirrhotic. The kidneys were of the "beer-drinker's" type. There was a little free fluid in the peritoneal cavity. The ankles were œdematous.

This case is evidently one of chronic alcoholic poisoning with gross cardiac, hepatic, and renal damage, in which a terminal lobar pneumonia occurred. The chief point of interest is whether the interference with the expansion of the right lung, caused by the old injury to the ribs, favoured the development of pneumonia at that particular site.

We are indebted to Sir James Purves-Stewart for permission to publish the clinical notes, and to Dr. J. A. Braxton Hicks for the post-mortem findings.

DONATIONS AND BEQUESTS.—Mr. William John Checkley, of Lindfield-gardens, Hampstead, left £1000 each to the Middlesex Hospital (for cancer research) and the Home for Incurables, Putney, and £500 each to the Brompton Hospital for Consumption and the National Hospital for the Paralysed and Epileptic.—Mr. John Dickinson Eaton, of Kenwood, Park-road, Sheffield, besides bequests for other charitable purposes, left £1000 each to the Sheffield Royal Infirmary, the Sheffield Royal Hospital, the Derby Infirmary, and the Rotherham Infirmary, and £500 each to the Ilkeston Hospital, the Jessop Hospital for Women, and the Sheffield Children's Hospital.—By the will of Mr. F. H. Lambert, of Penarth, Glamorgan, who left a fortune of £248,140, with net personalty of £244,771, the testator, after gifts to his secretary and servants, left the residue of the property in trust for his wife for life, and on her death one-fourth to the Free Trade Union, and one-fourth equally between the Salvation Army, Coal Trades Benevolent Association, King Edward VII. Hospital, Cardiff, Cardiff Institution for the Blind, Royal Merchant Seamen's Orphanage, the National Institution for the Blind, Great Portland-street, London, the Salvation Army Maternity Home, Cardiff, the British Home for Incurables, and the Women's Metropole or Hotel in Cardiff (of which Miss Swain is the present superintendent).—Among other bequests Miss Frances Ripley, of Leeds, left £1000 each to the Leeds General Infirmary, the Leeds Public Dispensary, St. Dunstan's Hostel for Blinded Sailors and Soldiers; £500 each to the Leeds Hospital for Women and Children, the Leeds Incorporated Institution for the Blind, Deaf, and Dumb, and the Leeds branch of Dr. Barnardo's Homes.—By the will of Mr. Francis Almond Hocking, pharmacist to the London Hospital, the testator left his microscope to the London Hospital, Whitechapel, and subject to two life interests, 750 guineas upon trust to establish one or more annual prizes for competition among students of the London Hospital Medical College.

Medical Societies.

THE BRITISH INSTITUTE OF RADIOLOGY.

AT a meeting held at this Institute on Feb. 20th the chair was taken by Dr. L. A. ROWDEN, and Dr. A. E. BARCLAY read a paper on

THE MECHANISM OF SWALLOWING.

An analysis of the movements seen on the X ray screen, he said, showed that many of the current ideas about the mechanics of swallowing needed revision. When food was swallowed the whole larynx, with the trachea, rose; the pharyngeal space was obliterated for a fraction of a second and the mass of food was thrown back by the action of the tongue and dropped through the pharynx and for some distance down the œsophagus as if there were no walls there at all. Not until it reached the level of the clavicle did it seem to be imprisoned in any way, or show any indication of peristalsis. To analyse the process, a fluid was useless, as it passed too quickly, and a very thick food induced a gymnastic type of swallowing; therefore food with a normal consistency should be used. Both nose and mouth must be closed for swallowing. If the lips were open the mouth was sealed off by the tongue fitting the roof, while the soft palate sealed off the nasopharynx. At the same time the larynx was drawn up about half an inch and the tongue pressed still more forcibly against the hard palate, from the tip progressively backwards, forcing the food back into the pharynx. When once the bolus had actually left the tongue there was little, if any, sign in the X ray of any muscular action propelling the mass from behind. It gave the impression rather of being sucked down, a very different appearance from that, for instance, of the passage of food through the small intestine or lower œsophagus. The rapidity of the passage through the pharynx was extraordinary; it took perhaps an eighth of a second to pass from soft palate to behind the larynx. The same type of food squirted into a glass or rubber tube would slide down very slowly. There therefore seemed to be some suction action at work.

To account for this appearance the speaker had studied many subjects, either swallowing opaque food or insufflated with bismuth and lycopodium. He had found that the pharynx was completely emptied of air and became a potential space for just a fraction of a second before swallowing. As the hyoid rose the tongue slipped down inside it and pressed into the upper larynx, obliterating it right down to the false vocal cords, while the epiglottis was pressed vertically against the back of the pharynx. At the same time the mouth of the œsophagus was pulled right up behind the larynx and into contact with the epiglottis, thus covering up the larynx from behind. The character of the mucous membrane of the parts confirmed this view of the mechanism. Parts that had to stand wear and pressure were lined by stratified squamous epithelium; this epithelium covered the upper part of the back of the epiglottis and the upper part of the aryteno-epiglottic folds, and these areas also had taste buds, suggesting that they were exposed to the food stream. A number of films also showed a streak of air in the œsophagus, suggesting that when it was pulled up it became an open-mouthed receptacle like a Christmas stocking. Apparently the upper larynx opened up again as the hyoid came down, while the œsophagus waited in its epiglottic position for the bolus to be popped in, just as the nestling holds up its open beak until the mother pops in the worm and then sinks back into the nest. When nasal mucus stuck just below the nasal pharynx efforts to swallow it seemed to have very little effect. On analysing the attempt it could be realised subjectively that it was not direct muscular action that was aimed at but the suction of swallowing, and this could not be increased beyond a certain point. There was very little voluntary power over mucus on the posterior wall of the pharynx and, as seen radiographically, food seldom touched the back of the pharynx. The act of swallowing began with the tongue and ended at the junction of the upper and middle thirds of the œsophagus where peristalsis appeared, where foreign bodies nearly always lodged, where the nerve-supply changed, where the muscle altered from voluntary to unstriated in type, and where the muscularis mucosæ became increasingly prominent.

Prof. J. PRESTON MAXWELL then read a paper on

Osteomalacia and Fœtal Rickets.

It seemed to be clear, he said, that true osteomalacia was the manifestation of rickets in bones that had reached maturity, and that it was connected with a shortage of vitamin D and in most cases with an actual calcium starvation. It must be distinguished from other diseases causing osteoporosis, such as hyperparathyroidism, pseudo-osteomalacia malignum, and in rare instances hyperthyroidism. It was a matter of doubt whether the so-called physiological osteomalacia of pregnancy (Hanau) was not a mild form of osteomalacia. In most cases the blood calcium was reduced to 5–8 mg. per 100 c.cm. of serum and the blood phosphorus to 1–2·5 mg. per 100 c.cm. Deformities might affect the chest, pelvis, or long bones or any two or all of these. Pure kyphosis was rare, but kypho-scoliosis was common. There was no actual destruction of bone, but the new bone laid down was osteoid. The ribs tended to become flattened, producing a modified form of pigeon-breast, and the sternum crumpled up so that the distance from the episternal notch to the ensiform cartilage might be reduced to two inches. The four characteristic deformities in the pelvis were yielding at the acetabulum and ilio-pubic junction, producing rostration of the pelvis; yielding at the ischio-pubic junction, resulting in the narrowing of the trans-ischial diameter, and a curious twisted crumpling of the ascending ramus of the ischium and descending ramus of the pubes; shortening of the sacral index, its anterior surface becoming much more concave and the coccyx being carried forward so as almost to block the pelvic outlet; and rolling of the crests of the ilia, so deepening the iliac fossæ. The general picture was triradiate. Irregular bending and transverse fractures were the two principal deformities of the long bones. Coxa vara was very common, and the clavicle might be bent almost double.

Radiology could distinguish well-marked cases of the different types of osteoporosis, but not the milder cases. It could also help in obstetrics in revealing the shape and size of the osteomalacic pelvis. The child did not escape the ill-effects of the mother's disease; it might be starved of calcium or be born with a tendency to rickets, or with actual antenatal rickets. Appropriate treatment for the mother would provide the necessary vitamin, calcium, and phosphorus for the child. Osteomalacia yielded to a sufficient supply of these substances, either in the form of irradiated ergosterol or of cod-liver oil, but preferably a combination of both. The patient must also have sunshine, or ultra-violet light, and exercise. The disease appeared in men as well as in women, and might be seen in the mild form at puberty or even after the menopause.

Discussion.

Dr. BARCLAY showed a slide illustrating rickets in an experimental rat; one hundred thousandth of a milligramme of vitamin D, he said, prevented this condition.

Dr. G. B. BUSH related the case of a lady who had complained of extraordinary mobility of the fœtus and of pains in the thighs. He had given cod-liver oil quite empirically, and the symptoms had disappeared. He asked how large the doses of cod-liver oil for osteomalacia should be.

Dr. MAURICE WEINBREN asked whether osteomalacia was caused by a general lack of ultra-violet light throughout the year or at certain periods of the year.

Dr. A. J. ILES asked if the lady mentioned by Prof. Maxwell had been living on rice.

Dr. RICHARD CONNELL asked if osteomalacia caused abortion, since certain manufacturers of cod-liver oil had advocated it as a remedy.

Prof. MAXWELL, replying, said that in an advanced case the daily dose of cod-liver oil was one and a half to two ounces. A milligramme of ergosterol with a teaspoonful of cod-liver oil gave better results. Most of the patients came from an altitude of 2500 ft., and belonged to the middle classes who could not afford proper diet and were too proud to work in the sun but lived in their houses in the dark. The lady had not been living on rice, and her husband, a medical man, had been giving her calcium, which was not being absorbed. Abortions did not appear to be more common in the osteomalacial region than anywhere else.

Dr. JOHN MUIR read a paper on

The Irritable Colon.

He first emphasised the fact that great caution must be exercised in the X ray observation of disordered function. In many patients vague dyspeptic symptoms were associated with colonic disorders. Treatment of the gastric trouble was but palliative, and purgative mixtures, though they gave temporary relief, finally aggravated the condition. The radiologist also knew a group of cases with gastric symptoms but no indication under X ray of any recognised lesion. A formula frequently used was: "the duodenum shows signs of irritation which may be due to local ulcer, but no direct evidence of such ulcer is detected, and appearances may be due to reflex irritation from gall-bladder, appendix, or colon." The X ray in these cases showed spasm in the pyloric vestibule, pylorus, or duodenal bulb. "Only spasm" might exclude organic lesion, but still demanded explanation. Gentle palpation to relax the pylorus might defeat its own ends by increasing the spasm, and the patient should be allowed to lie down and rest for a time. When duodenal ulceration had been excluded there remained a large group of cases in which pylorospasm was accompanied by a constantly changing spasm of the duodenal bulb—"the ghost bulb." If the patient were carefully observed and the proper technique used, the bulb would assume its normal shape from time to time, thus eliminating organic change. If there were a history of hæmorrhage and tenderness over the bulb the possibility of ulcer was still present, but in the absence of these signs the source of irritation must be sought elsewhere. The gall-bladder produced a typical kind of protracted spasm of the pyloric third of the stomach, so that it assumed a sausage shape, indented ever so slightly by each passing wave of peristalsis. If the gall-bladder could be excluded the appendix was all too often incriminated. It should not be accused in the absence of two out of three definite localising signs—viz., fixation, tenderness upon pressure over the visible appendix, and undoubted stasis in the end of the ileum. Kinks and irregular filling did not indicate an abnormal appendix. If the colon were at fault the tenderness was distributed along its course and often accentuated over the middle of the transverse colon or over the descending colon. Eighteen to twenty-four hours after an opaque meal the X ray would show irregular segmentation and sometimes stretches of narrowing with dilatation of the proximal part. An opaque enema showed this narrowing and was often seen to pass along a somewhat spastic pelvic colon and to shoot along a rigid narrowed descending colon in a very striking way. Both methods were needed for diagnosis, and in most cases screen observation was almost equally important. Great caution was required in the interpretation of colon shadows, for there was a very wide variation within the limits of the normal. An organic lesion showed permanent alteration; the irritable colon was characterised by great variability.

It seemed hopeless at present to correlate this radiological condition with any clinical entity. Most cases seemed to result from long-standing constipation or long-continued but ill-advised efforts to combat constipation.

Dr. G. E. **Vilvandré** thought that there was no connexion between duodenal ulcer and spasmodic contraction of the colon. Spasm might be seen in diverticulosis before diverticula appeared. Early carcinoma would also cause local irritability. Spasm was usually due to a local condition. Pylorospasm in the great majority of cases meant duodenal ulcer.

Dr. **Connell** pointed out the frequency with which neuroses attacked the pyloric and sigmoid regions. The sigmoid might be rigidly anchored to the brim of the pelvis by a mesentery, and might become irritable in conditions of overwork and worry. Considerable amount of irritability was normal after an enema, when the colon had been filled to its fullest capacity. The radiologist should be reluctant to diagnose small areas of irritability or spasticity as abnormal in the absence of any organic disease.

The **Chairman** thought that further investigation with opaque enemata might show that many cases of irritable colon were due to diverticulosis in a prediverticula stage.

Dr. F. E. **Lynham** spoke of the effect of massage in removing apparent spasm.

Dr. **Muir**, in reply, pointed out that he excluded all localised spasm and had dealt only with generalised irritability.

ROYAL SOCIETY OF MEDICINE.

SECTIONS OF OBSTETRICS AND ELECTROTHERAPEUTICS.

At a joint meeting of these Sections on Feb. 21st, with Mr. **Arthur Giles**, President of the Section of Obstetrics, in the chair, a discussion on the Position of

RADIUM IN THE TREATMENT OF GYNÆCOLOGICAL CONDITIONS

was opened by Mr. **Malcolm Donaldson**. Five or six years ago, he said, he had tried to interest the Obstetric Section in the treatment of carcinoma of the cervix uteri by radium. He had not only failed, but had been denounced as an enthusiast. Since that time the pendulum had swung to the opposite extreme. Radium had proved to be one of the most valuable of therapeutic agents, but he wished in his present paper to discuss some of the difficulties of its use. Of the action of radium our knowledge was poor, but there was one outstanding fact—namely, that quickly growing tissues, that is to say, cells which were in an active state of metabolism, were far more affected by radiation than more stable cells. All radiotherapy was based on this fact. It was not known why the quickly growing cells of a tumour should be sensitive to radium; but a direct action was evident in its effect on cells in tissue culture. Under radiation these cells showed a cessation of mitosis, but on removal of the radium mitosis returned. Further, an irradiated tumour, on transplantation, would not grow in its second host. Histological section of irradiated tumours showed that the cells in the vicinity of the radium were disintegrated. But this action did not explain why some tumour cells were more sensitive to radium than others. Tumours of the vulva, for instance, were much more resistant to radium than those of the cervix. On what did this depend? Was it the blood-supply or was it the histological structure of the growth? Hypertrophic carcinoma of the cervix was more radiosensitive than ulcerative carcinoma; possibly in hypertrophic carcinoma the cancer resistance of the patient was higher—a factor which must be taken into account. There was evidence of an indirect action of radium on the blood-supply in the obliteration of vessels by fibrous tissue; probably the fibrosis played its part in destroying the tumour, and at one time it was believed that the action of radium depended entirely on the formation of fibrous tissue. It was probable that the action on the tumour cells, the obliteration of arteries, and the stimulation of fibrosis all took part in producing the result, and that possibly the dying tumour cells gave rise to antibodies as well. It was still doubtful whether some wave-lengths had a specific action; some authorities believed the gamma rays to be selective in their action. Clinically, however, surgeons were tending to cut out the longer gamma rays by heavier screening. It was not yet decided to what extent a septic condition of the growth militated against radium treatment. Probably it had a markedly detrimental action on the results. Opinions still differed on the use of a large dose of radium inserted for a short time, and on the use of small split doses used intermittently for longer periods. At the present time small doses for long periods were more commonly used, but it was not known whether tissues exposed to repeated small doses acquired an immunity to further treatment.

Technique.

With such imperfect knowledge of the action of radium technique was bound to be empirical. But before results could be compared it was necessary to clear up the existing confusion about radium dosage. To give the number of milligramme-hours was not sufficient; 1·0 mg. might be inserted for 100 hours, or 100 mg. for 1 hour; both would give a dose of 100 mg.-hours, but the results would be very different. Any minutiæ on dosage must include the weight of radium element, the number of containers, the size of the containers and the thickness of their walls, the position of the containers in relation to the growth, and the length of time they remained in position. For carcinoma of the cervix there were three well-known techniques. First, the Stockholm technique, in which 120 mg. was applied to the surface of the growth on three occasions at intervals of one or two weeks, and remained in position for 24 hours. Secondly, the Paris technique, also a surface application, in which 60 mg. were used and left in situ for five or six days. And thirdly, the Brussels technique, in which 40 to 50 mg. were used and left in position for any period up to 15 days. At St. Bartholomew's Hospital a needle technique was used, in order to distribute the radium, and the containers were left in position for 144 hours. It was impossible to say which was the best of these methods, because there is no means of comparing identical cases. In nearly 100 per cent. of cases it was possible to clear up the primary growth, but the problem lay in treating the glands efficiently. Apart from dissection, this could be attempted in two ways: by X ray applications to the glands and pelvis, and by intra-abdominal radium. The technique which the speaker used for the insertion of intra-abdominal radium required a double operation. The abdomen was opened and 20 needles, each containing 2·0 mg. of radium element, were sewn round the pelvis; after a week the abdomen was re-opened and the needles were removed. When first using this technique he had packed the intestines away with gauze, but this had caused a severe reaction and he had discontinued it without any evil results. After five years over half of his cases treated in this way were still living. Radium used in conjunction with X rays was more effective than radium alone. It was not justifiable to treat carcinoma of the cervix by radium alone, inserted per vaginam, since the disappearance of the primary growth only could not be considered to be efficient treatment. Carcinoma of the vagina could be quickly removed by radium. Carcinoma of the vulva was considered to be markedly radio-resistant, but recent work with small doses spread over the vulval area and left in situ for 10 days to 6 weeks had produced good results locally. Treatment of the glands by embedding radium containers in Columbia wax spread over the whole inguinal area was probably the most effective method where sufficient radium could be obtained. Carcinoma of the body of the uterus was still best treated by hysterectomy; where this was contra-indicated, 50 mg. of radium left in the uterine cavity from 10 to 14 days, and combined with X ray therapy, had been of value. Chorion-epithelioma should also receive combined X ray and radium treatment where possible. In benign conditions an artificial menopause could be readily produced by insertion of 50 mg. of radium into the uterine cavity for 3 days; the cessation of menses might be temporary or permanent, but if it was temporary a second dose usually stopped further menstruation. Fibroids, if small and if the patient was over 40, could usually be treated successfully by radiotherapy. At the present time dogmatism about technique in benign conditions might be amusing but in malignant conditions it was wicked.

Position of the Radiologist.

Dr. J. E. A. LYNHAM, speaking for the Electrotherapeutic Section, said that the position of the radiologist was ill-defined; he was expected to consult with physicians, surgeons, and gynæcologists on any branch of their work, as well as to control all the electrotherapeutic apparatus under his charge. Coöperation between surgeons and radiologists was essential, and collective thought was particularly valuable in the treatment of malignant disease. In benign conditions an artificial menopause could be established readily with either X rays or radium, and it had been stated that X rays affected the ovaries while radium affected the endometrium. In carcinoma the effect of radium on the stroma was probably the more important action, while in sarcoma the results were obtained by the action on the cells. Early failures had been due to overdosage. In his experience the best results were obtained by the use of X rays following radium. Screening had become necessary because with unscreened radium the damage to neighbouring tissues had been so severe, and the present tendency was to increase the thickness of the screen. Where glands were involved a rapid enlargement took place if the primary growth alone was treated. An alternative method for the use of intra-abdominal radium to that of Mr. Donaldson was the attachment of the container to a retroperitoneal drainage-tube which could be drawn out later. This seemed preferable to a double abdominal operation, which recalled the aphorism: "One has to be very robust nowadays to be a good patient." Life could be prolonged in many cases by treatment of glands with heavily screened high voltage X rays or by the use of a radium searchlight, and the real test of such treatments was the length of life of the patient. Radiotherapy was not based on the principles of surgery, and applications should be continued for some time after the disappearance of the growth; recurrences could be slowed in their rate of growth, if not removed, by a fresh application of radium. He considered that a two-stage operation for treatment of a primary growth offered an effective technique; on the first occasion the needles were placed round the growth, and on the second occasion, after an interval of 14 days, they were inserted into it. It was important to remove all septic foci, such as infected teeth and tonsils, before irradiation, for they materially affected the results. In conclusion, he would say that the radiologists had never anticipated that radium might be used to replace operative treatment. A combination of the two methods was obviously much more valuable. Systematic and exhaustive trials of technique must be made. The subject was at its beginning, and personal views should always be submitted to groups of workers for assessment.

Treatment of Menorrhagia.

Mr. STANLEY DODD said that the production of an artificial menopause probably depended on the selective action of the gamma rays on the ovary. The return of menses in many cases showed that the rays had not penetrated to the deeper immature ova. Cases in which the production of an artificial menopause by radium was indicated were as follows: Where the menses were regular but profuse as in chronic subinvolution; with severe bleeding at the climacteric; in persons with pulmonary tuberculosis who were losing more than they could afford at their periods; in fat women with fibroids, or in women with fibroids and other contra-indications to anæsthesia; with severe dysmenorrhœa which would respond to no other treatment. The last was justifiable only if all other treatments had been tried unsuccessfully. As regarded other benign conditions, the use of radium in cervicitis was usually disappointing, owing to the infective condition present. To produce an artificial menopause the smallest dose of radium which would produce the desired effect should be used, and in an elderly patient the dose required was smaller than in a younger one. Complications of the treatment were pain, usually transient, which disappeared on removal of the radium; and malaise, which was best treated by rest in bed and a tonic. The results in his series had usually been good, with few recurrences of menses. A second dose had always stopped mentruation permanently. One cervix diagnosed histologically as precarcinomatous which he had treated with radium needles was now perfectly normal. Among his cases of carcinoma of the cervix he had a cure rate of 40 per cent. after five years. Radium eradicated the primary growth and then the glands were removed by abdominal operation, and intra-abdominal radium was applied. His technique was as follows: The cervix received three applications of radium; 14 days after the last the abdomen was opened and after removal of the regional glands two catheters were introduced, each containing five radium needles in series; the needles were 2·0 cm. long, contained 1·0 mg. of radium, and were screened by 1 mm. of platinum. One catheter passed from the sacro-iliac synchondrosis round the pelvis to Poupart's ligament, where it pierced the abdominal wall and was sutured. The other, bent in a crook, lay with its curved end in the obturator foramen, and its free end also piercing the abdominal wall. The peritoneum was sutured over both catheters which were withdrawn by gentle traction after seven days. Such a technique as this might solve the problem of intra-abdominal radium applications when the dosage had been more accurately determined.

Discussion.

Dr. RUSSELL REYNOLDS said that radiotherapy could not be dissociated from deep X ray therapy. In his experience it was important to use the split-dose technique. Large doses of radium lowered the resistance of both the tissues and the patient. With split-dosage a larger dose could ultimately be given. It was important to use X rays and radium in conjunction, since radium has a local action and X rays have a more general one. He had had good results from combined treatment, especially in tumours of the lung. In these cases the tumour still seemed to exist but the patient remained well for several years.

Dr. W. M. LEVITT said that X rays were a form of treatment complementary to radium since one was peripheral in action and the other central. After X ray treatment recurrence was usually local, while after radium it was generally deep. Both damaged the cancer cell, but the type of injury was probably different. In combined technique the sequence was of importance and he believed better results to be obtained if X rays were given *before* radium. He would be interested to know why Mr. Dodd preferred to obtain an artificial menopause by radium when it could be obtained safely and without discomfort by X rays.

Mr. Gilbert Scott said that the disappearance of the primary growth alone usually meant the disappearance of the patient after a varying number of years. Five years did not necessarily mean a cure; it was not the primary growth that killed the patient, nor the secondary involvement of glands; metastases in liver, spine, and thorax were the cause of death. We should not speak of cure until we could prevent the appearance of these metastases.

Mr. James Wyatt asked whether the speakers were convinced that in the production of artificial menopause the action of the radium was really on the ovary and not on the uterine walls. The menopausal symptoms in these cases were slight or absent. He had found radium to be of value in treating pruritis vulvæ, often when X ray applications had given no relief. Also in endometrioma radium relieved the pain and caused regression of the tumour.

Mr. Martin Oldershaw said that he believed the production of artificial menopause was due to the action of radium on the endometrium only. X rays gave symptoms much more like those of the artificial menopause caused by removal of the ovaries. He believed the recurrence of menses after radium to be due to an incomplete irradiation of the endometrium; the dose should be arranged to affect the whole lining. The advantage of radium was that a thorough examination, with curetting, could be made under an anæsthetic before its introduction.

Mr. Duncan Fitzwilliams said that the physicists say that the gamma rays would not penetrate from the uterus to the ovary, but he had seen a case of cerebral tumour treated with radium where the hair on the side of the head near the radium turned white and fell out. The hair on the opposite side of the head, five and a half inches away from the radium, did the same thing. In removal of glands block dissection was still the sheet anchor; he doubted the value of retroperitoneal radium. But it was wrong to confine oneself to one method of treatment, and he believed combined treatment to be of value, though he had been repeatedly disappointed in the results of X ray therapy for carcinoma.

Mr. Patterson gave some figures, which he said were incomplete, collected during the past two or three years at St. Bartholomew's Hospital. Although not sufficient for exact analysis these tended to show that the more immature the type of cell composing the tumour, the better is the prognosis for radium treatment.

Mr. R. E. T. Strachan mentioned some practical difficulties in the insertion of radium into a friable carcinomatous cervix. He considered that radium treatment was prolonging life, but that cure was not yet in sight. In a certain proportion of cases of carcinoma of the cervix treated with radium, fistula occurred. He was not clear whether it was due to the radium or whether it would have occurred in any case.

Dame Louise McIlroy said that radiologists should be present at operations and advise on the insertion of radium. She had found a small but prolonged dose of radium valuable in the menorrhagia of puberty; she had used radium as a preliminary to operation, also in cases where bleeding fibroids had caused collapse. She would be interested to know whether, in cases with severe anæmia, radium did not tend to aggravate the anæmic symptoms. In some cases of menorrhagia with septic teeth and tonsils the removal of these foci caused a cessation of symptoms without the need of radium.

The Chairman said that radiotherapy should be regarded as supplementary to surgery. Radium should be used to produce an artificial menopause when arrest of bleeding was the primary consideration, and X rays when the menopause was desired primarily.

Replies.

Mr. Donaldson said that radium should be used to produce artificial menopause in cases of irregular bleeding, after a thorough examination of cervix and uterus. Pain was usually due to proctitis and passed off on removal of the radium unless some more serious cause was present. Anæmia should be corrected by blood transfusion before the use of radium. As to artificial menopause, the ovary was very radiosensitive, and might well be affected by radium in the uterus.

Dr. Lynham said that while radium in the uterus might have some effect on the ovaries this was probably small; the uterus was more likely to be affected. He had had good results from radium in endometritis using small doses for a short time with thin filters. Pain was usually transient but occasionally severe.

Mr. Dodd said that no one knew whether the ovaries or the uterus were affected in bringing about the artificial menopause. Probably both underwent some change.

SECTION OF SURGERY: SUBSECTION OF PROCTOLOGY.

At a meeting of this Subsection on Feb. 12th, with Mr. Cecil Rowntree, the President, in the chair, a discussion took place on

Factors Making for Safety in the Surgery of Colon and Rectum.

Mr. G. Gordon-Taylor said he had no new precept to inculcate nor any very novel point in technique to submit which was likely to bring about a marked diminution in mortality; he would deal mainly with the factors making for safety in the surgery of cancer of the large bowel. In this branch of surgery safety of operation was not the only consideration, for the most thorough extirpation of the disease held out the brightest prospect of cure. In cancer surgery the watchword should be "efficiency with safety."

The mortality from radical surgery in cancer of the colon was capable of reduction, as a study of statistics would show. Mr. Grey Turner had rightly insisted that in surgery operability and mortality went hand in hand, and had stated that he regarded a 5 per cent. mortality for colon resection for cancer as representing the acme of judgment and the perfection of technical skill. In the removal of a carcinomatous colon, success or failure depended upon the manipulation necessary to deliver and resect the tumour and upon the healing of the anastomosis required to restore the continuity of the intestinal canal. It was certain that preliminary drainage had a profound effect on the septicity of the bowel contents, and even on the bowel wall itself at the site of the new growth. When a cancerous cæcum had to be removed the speaker was not sure that a most valuable measure of safety was not a previous ileo-transversostomy. If a cæcostomy was to be performed as a preliminary procedure, it was not enough to make a valvular cæcostomy; an actual artificial anus should be established, so that the fæcal stream was largely or wholly deflected. But valvular cæcostomy could advantageously be used as a temporary measure in cases where resection of the large intestine was necessary because it was secondarily involved in some morbid process which originated in an adjacent structure. With the increase in his experience, Mr. Gordon-Taylor found himself preferring more and more the two-stage, or perhaps the three-stage operation; he was sure the mortality was lowered thereby. Preliminary blood transfusion was especially indicated in cases in which there had been intestinal hæmorrhage, whether occult or otherwise, and it was the most valuable method available for treating post-operative shock. Of preliminary immunisation he had had but a small experience. Bowel mobilisation was of course very important. He had no particular views on how anastomosis should be carried out. When an attempt was made to perform a really radical extirpation of the potentially affected zone he employed end-to-end suture or a side-to-side junction; he did not like so much the end-to-side method of union. What was important was the manner of performing the anastomosis. The exteriorisation methods of the Paul-Mikulicz type of colonic resection gave the lowest mortality. As regards methods of intra-abdominal anastomosis, it should be borne in mind that many of these patients were elderly, and many had degenerative changes in their vessels, so that a tendency to thrombosis in arterioles and veins supplying the bowel wall was aggravated by bowel sepsis and the manipulations necessary in the operation. He avoided all large crushing clamps, contenting himself with a small Payr clamp at each end. Where possible, he avoided the middle line for his incision and the mid-stream of the abdominal cavity, making his attack, where possible, at the sides or in the flanks close to the tumour; and he always drained. In the event of a leak a drain was a great help.

Mr. Gordon-Taylor proceeded to deal in detail with the questions involved in extirpation of a cancerous rectum, remarking that the surgery of malignant disease was the surgery of the lymphatic system. The only really radical operation for a carcinomatous rectum was that of Ernest Miles; but the speaker had fairly often been compelled by circumstances to practise what he knew to be an imperfect operation. It was difficult to see how the figures of Mr. J. P. Lockhart-Mummery—from 2 per cent. to 3 per cent.—could be beaten. In performing the abdomino-perineal excision Mr. Gordon-Taylor had found that taking it as a two-stage operation made it much less formidable. In the case of a malignant rectum he always did a preliminary left iliac colostomy, doing the extirpation of sigmoid and rectum at a later date. At present there was a tendency to utilise radium therapy in addition to extirpation of the rectum by the perineal route, but the speaker regarded this as no more than a hypnotic piece of technique on the part of the surgeon. In recto-sigmoidal growths it was agreed that the abdomino-perineal method was the one needed. It was a severe one, and Lockhart-Mummery admitted a mortality of 27 per cent. from it. The greatest factor for safety in the management of a carcinomatous rectum was the judgment of the surgeon; and he would be the most safe and successful who employed the appropriate operation for the individual case.

The Significance of Obstruction.

Mr. Ivor Back expressed the opinion that any member of the Section could remove a portion of a normal colon and do an end-to-end anastomosis with absolute safety to the patient if he cut the colon obliquely, taking care of the vessels, and being careful about asepsis. Further, no member could do a primary resection of the colon with end-to-end anastomosis in the presence of obstruction without preliminary drainage and avoid killing the patient. Between complete obstruction and an entire absence of it there was every gradation, and there must be a stage at which obstruction had not yet reached the danger point, and where localised resection of the colon could be carried out without primary drainage. When the sigmoidoscope revealed a small carcinomatous ulcer of the colon which had not extended round the bowel and there was no obstruction, it was feasible and safe to do resection and end-to-end anastomosis. He asked what clinical, radiological, or other means were available for determining whether the degree of obstruction was such that a primary resection could be done without danger, or whether it was necessary to proceed to some of the other means of preliminary drainage. The moment macroscopic obstruction was present the problem became a difficult one. The safest operation which he knew for resection of a portion of the colon was that named after Paul, but it had grave disadvantages. At the second stage the colon which had been exposed was thick and œdematous, and suture of the œdematous colon was difficult. Further, however well the suturing was done and the operated part was put back beneath the rectus, in his experience there was invariably leakage, and this was tardy in healing. He thought it would be a good plan to make it a one-stage operation; to bring out the loop, fix it to the parietal peritoneum all round it, and to the mesentery, resect, and put the anastomosis back between the parietal peritoneum and the rectus. He had not tried it, and it was possible it might leak, but he did not think there was a real risk of peritonitis. He did not favour the side-to-side anastomosis, which had many disadvantages. He practised end-to-end anastomosis, either with suture or by Pringle's method. In the latter, however, the clamps did not take up the mucous membrane on both sides, and there was a risk of hæmorrhage at the point of junction. Still, Pringle's was a very good operation. As to the treatment of rectal carcinoma, he favoured the method of Ernest Miles. Admittedly it carried a high mortality; in his own cases it had been about 20 per cent.

Mr. Lionel Norbury said it was very difficult to render the large bowel aseptic, but a near approach to this was secured by frequent washing before operation in cases of chronic obstruction. He hoped soon to be using the new subaqueous apparatus for bowel irrigation, which promised well for this purpose. In the surgery of the colon the anæsthetic was very important. Spinal anæsthesia diminished shock, but in some cases it was rather dangerous—*e.g.*, in the presence of bronchitis—and practical inversion of the patient was needed. He was disappointed to hear lateral anastomosis was not recommended, as he leaned towards it, especially in resection of the sigmoid. He could not understand any surgeon not draining after the operations under discussion, as it certainly made for the safety of the patient. He had been very pleased to hear the opener's reference to temporary cæcostomy. Perineal excision of the rectum he did as a two-stage operation: first cæcostomy, and excision 7 to 14 days later.

Mr. W. B. Gabriel did not think that after valvular cæcostomy there was likely to be any deflection of the fæcal current; the operation succeeded if a suitable tube was put in.

Prof. A. W. Sheen agreed with the performance of lateral anastomosis following resection of the growth. With regard to the use of radium in connexion with malignant growth of the rectum, the difficulty was that the present attitude viewed radium as something to be used if there was a reason against operation. The question was whether there was likely to be much success with radium if that attitude were persisted in. He spoke of a case of very early carcinoma of the rectum, but which could easily be felt. It was localised on the lower rectal posterior wall. It all disappeared after two applications of radon seeds. Whatever was done, he thought operation for carcinoma of the rectum would always be a dangerous one.

Prof. Arthur H. Burgess thought that full credit should be given to Paul for the operation with which his name was connected. He, the speaker, had used spinal anæsthesia extensively, and, given control, he was sure its employment considerably diminished the operative risks.

Mr. E. T. C. Milligan gave details of some cases which had come to his notice and which, on account of wrong treatment, must be classed as tragedies. He had been in the habit of doing cæcostomy for obstructed growth of the splenic flexure, also of the pelvic colon.

Mr. Turner Warwick said it was difficult to know why operation done in two stages should show a lower mortality than when done at one attempt, but it certainly was so. He considered that the abdomino-perineal operation was well within the capacity of the average surgeon, and it did not call for any expert nursing experience. He contended that new growths of the colon were exceptionally malignant.

Mr. Gordon-Taylor, in reply, said that the tragedies in connexion with minor operations which Mr. Milligan mentioned constituted a strong argument in favour of preliminary cæcostomy or preliminary drainage of the bowel. He objected to the Coffey operation.

Acetylcholine in Relation to Abdominal Surgery.

Mr. A. Lawrence Abel sent a communication on this subject, which was read by Mr. G. Parker. Hunt and Taveau, he said, testing acetylcholine in 1906, found that it lowered arterial pressure. Choline seemed to be a breakdown product which was formed during the normal metabolism of the central nervous system. Excreted into the wall of the alimentary canal, it exerted a hormonic action on Auerbach's plexus. Work in Magnus's laboratory in Utrecht showed that paralysis of the bowel produced by chloroform poisoning was quickly relieved by intravenous injections of choline hydrochloride. Acetylcholine produced in human beings a lowering of arterial blood pressure; it had an anticoagulant action on the blood in vitro, and also an anti-anaphylactic power. It was chiefly indicated in Raynaud's disease, gangrene arising from arteritis, intermittent claudication, arterial hypertension and angina pectoris, retinal artery spasm and thrombosis, encephalitis, profuse sweats in tuberculosis, and alimentary disturbances. It was of value, too, he said, in cases of acute and chronic constipation. For a very severe abdominal case, when, on being seen for the first time, the patient was in extremis, he gave 0·6 g. of acetylcholine intramuscularly; for a less severe case, 0·2 g. at one, two, or three-hourly intervals.

CHELSEA CLINICAL SOCIETY.

DEFÆCATION.

A meeting of this Society was held at the Rembrandt Hotel, Kensington, on Feb. 18th, under the presidency of Dr. Hayward, when a discussion on Defæcation took place.

Dr. Harold Pritchard opened the discussion. He said that this age-long function was first intelligently written about in 1833 by James O'Beirne, and those writings were the foundation of subsequent thought. Seventy years later, Cannon, in America, published some interesting X ray observations on defæcation in the cat. In recent times more light had been thrown on the process by Dr. A. F. Hurst than by any other authority and he was responsible for most of the modern conceptions of it. As soon as a meal was taken, there was set up a series of peristaltic nervous contractions and impulses in the whole intestinal tract. After a meal the small intestine was always full, as well as the stomach. But this was not true of the large intestine. Here there occurred at considerable intervals a mass peristalsis; the contents of cæcum and ascending colon were transferred with one movement to a site further along the canal. The descending colon filled up from below, and when the pressure on the contents reached a certain intensity, those contents were projected into the rectum, and at this stage there was instituted a call to defæcate. The normal animal emptied the bowel as soon as this stage was reached. In the human subject that was not permitted; the whole trend of what was called civilisation was towards preventing that impulse having full play, thus paving the way to habitual constipation. The impulse coming several times a day, it was essential, in the speaker's view, that the rectum emptied at least twice in the course of the 24 hours; this habit was seldom observed, though the ordinary man would see that he did defæcate once a day. The average woman would be content with anything between once a day and once a week, so that one found constipation or other error of the defæcatory process was quite common in the female sex If the levator ani were trained to oppose the natural desire for evacuation, there would result an accumulation of ever-hardening fæces, and then not only was it difficult, but also painful to get rid of this accretion. Ordinarily the contents became less fluid as the rectum was approached, and the longer they were retained in the latter, the harder they became. This was the condition known as dyschesia. The only treatment of this which was rational was to empty the rectum by means of an enema, not by aperients.

The effects of constipation were very far-reaching and it was not his intention to enter into them. Diet, however, was very important, especially the amount of fluid taken. He supposed that most people drank too little fluid. Water, taken first thing in the morning, before dinner, and again the last thing before retiring, was one of the most valuable adjuncts to the procuring of a regular action of the bowels. As to drugs, he reminded the meeting that it had been declared by a Chancellor of the Exchequer that £400,000 per annum was recouped by the Exchequer for Stamp Duties on proprietary medicines, 90 per cent. of this being probably for the correction of constipation. It represented about three million pounds spent every year on these medicines. When the bowel was loaded with hard, solid fæces, it was absurd to flog the patient with aperients. A very good rule in such cases was to oil from above, and wash out from below.

One could not neglect, said Dr. Pritchard, consideration of the psychological aspect of this question of defæcation. It was well known that a mental upset, or some agitation of the central nervous system, would largely influence the intake of food, and its digestion. He was not a great believer in psychology as applied to medicine, but of this influence of the mind on the food he entertained no doubt. Psychology taught that the child derived a good deal of satisfaction, even pleasure, from the act of defæcation; that, however, was a matter of opinion. It seemed equally certain that the child had a tendency to become constipated, and so it sowed early the seeds of an aberrant defæcatory process. Children gave the defæcatory processes and demands free play, largely disregarding the sociological and æsthetic aspects; but as education and social amenities increased, the tendency was more and more to hold the function in check, so that while the first part of life was spent in learning how to defæcate, the latter part was spent in learning how to overcome constipation.

Individual Variations.

Mr. Ivor Back agreed that in savage races and in animals in the wild state, defæcation was truly a post-prandial function—i.e., the bowels were emptied after each meal. But in civilised communities that would be grossly inconvenient, and so house-trained man had accustomed himself to making a defæcation once in 24 hours suffice. That, however, was not the only ritual which was consistent with perfect health; he was sure all those present had patients who were accustomed to go three and four days or longer between actions of the rectum. In such cases one was likely to do more harm than good by insisting on a system of mild or severe purgation, as it meant upsetting the person's natural rhythm, in addition to the risk of making the patient a drug addict. A Dutch surgeon, Treowen, reported a case in which the bowels were opened once every three months; another said a patient went five months between these acts, while De Villiers had a patient who went once in two years. Also there was the famous case of Emily Plumby, born in 1850 with an imperforate anus, who lived 122 days without any evacuation whatever, and during that time she had only occasional nausea and regurgitation of her mother's milk. They were classical cases; but while he was a student there came to hospital (St. George's), with nothing important the matter with her, a woman who when asked if her bowels were regular said they were. The house surgeon followed up the question with "So you have an action of the bowels every day?" To that she replied in the negative, adding that all her life she had had four actions of the bowels every year. She was given treatment for the complaint she came about, and he believed she was still having an action of the bowels quarterly. She confessed, however, that it was "a bit of a business," and when it was over she was accustomed to go to bed for 36 hours. Perhaps the total time spent over the function did not greatly exceed that spent in smaller amounts by ordinary folk. Fleck reported a case who had only six actions of the bowels a year, and told the patient that it was dreadful. He sent the man to take the waters at Marienbad, where he drank freely of them, and within five weeks of going there he died. This showed that harm could come from interfering with the natural rhythm of the particular body. For that reason he was opposed to the use of purges and various forms of paraffin in people who did not seem to be suffering from their long periods between motions. Sir Frederick Treves had published a case of a woman who was in the habit of taking large doses of magnesium sulphate for constipation. She passed some of it each day, but some remained behind; she died, and then a ball of magnesium sulphate was found blocking the ileo-cæcal valve.

Aberrations in the constitution of the dejecta were more important than aberrations in the periodicity of the act. Many people accustomed to a city life said their motions were broken up, and the speaker regarded this as an indication of a low degree of colonic streptococcal infection, perhaps not enough to be dignified by the term colitis. Its frequency could not be wondered at by those who had watched the events attendant on the baker's daily delivery of bread. A loaf would be dropped in the gutter, and retrieved and delivered at a house without any attempt at cleansing. In more extreme degrees the motions were tape-like. This kind of motion was more often the result of a squeezing of the fæces by an inflamed colon in a state of spasm than of a definite organic obstruction. In very many cases the cause was an obstruction at the anal orifice, sometimes as a result of a badly performed operation for piles. In the more extreme degrees of inflammation, colitis proper, there was a further breaking up of the fæces—namely, diarrhœa.

He regarded persistent diarrhœa as a more serious symptom than continued constipation, unless the constipation marked a departure from that person's normal rhythm—i.e., after going along well after a mild purge he found he needed definitely to increase the amount. He regarded this latter as one of the earliest indications of carcinoma in some part of the large intestine. Any case of persistent diarrhœa called for the use of the sigmoidoscope, and a microscopical examination of the fæces should be made on three or four occasions, one negative result being disregarded. Blood in the motions was, most often, an evidence of some morbid condition of the anal canal, especially if its presence be constant; and the commonest causes were piles and fissure. If there was no anal cause, blood streaking the motions should be regarded as of serious import, as being the first sign of carcinoma. He described a case of the kind which was diagnosed very early in this way, the carcinoma having a stalk. Five years after removal the patient remained quite well. Lastly, he referred to the class of case in which a middle-aged woman passed constipated motions, with mucus. He had never been able to discover a focal cause for this condition, and he leaned to the view that it was an accompaniment of an unhappy private life,

Constipation in Women.

Dr. F. J. **McCann** did not think women as a whole were quite so constipated as was generally supposed. He fully agreed that what was so important in this matter was the bodily rhythm, and that not every person needed to, or had a call to, evacuate after each meal. One case of great reluctance to go to stool he traced to the presence of a tear in the perineum. Repair of this led to a very satisfactory regularity of toilet. And it should be remembered that one result of frequent child-bearing was an eventual wide separation of the levatores ani muscles, which greatly lessened her power of expelling motions. Sometimes the results of a Whitehead operation for piles were disastrous. Mucous polypi he looked upon as danger-signals, and he noted Mr. Sampson Handley had recently lectured on the relationship of polypi to carcinomata. Cathcart, of Edinburgh, had done much in pointing out the essential similarity between innocent and malignant disease. The riddle of the simple tumour was a very deep one; we did not yet know what were the laws of growth, nor why a tumour, long resident in the body without increasing in size, should suddenly take on rapid growth.

Dr. H. B. **Carlill** said that he had seen obstinate constipation in subjects of tabes dorsalis, so bad that a general anæsthetic had to be given so that the lower bowel could be cleared out. He agreed that it was a sudden alteration in the habits and rhythm of life which was the important consideration in the subject under discussion. Nurses often gave enemata when there was nothing within the reach of the finger to remove.

Dr. **Murray Levick** remarked on the paucity of the references to diet, which he regarded as very important in this connexion. There was a close analogy, he considered, between constipation and gout. Two generations ago most people of position suffered from gout, and much brilliant work was done on it. The chief reason for its greatly diminished frequency nowadays was that as a rule people did not now eat too much. When the general population had given up using white flour for bread and pastry, and had taken to eating whole grain, with the husk and the germ, constipation would, he thought, disappear. Several of his patients had given up white flour, with very great benefit, and he did not know of anyone who had taken to whole meal flour and who continued to be constipated.

Mr. L. C. **Rivett** said that, speaking as a gynæcologist, he had many times watched the newly-born infant defæcate after each meal, and had come to the conclusion that the stimulus of taking a meal was normally responsible for the opening of the bowels. Defæcation could be inhibited by mental effort, and he was sure that much could be done by instituting a very hard-and-fast time rule of visiting the rear. He agreed that a large proportion of the women of the country were constipated, and one reason of this was that they did not take sufficient fluid; certainly they took less than did men.

Dr. A. **Orliansky** said that people varied greatly in the matter of emptying the rectum. In some the meal progressed slowly along the intestinal canal and constipation was caused by combination of spasm and atony in different parts of the bowel. Another type was that in which there was cæcal stasis. In these cases it was found there was still a trace of the barium meal in the cæcum 48 hours to four days after it was taken. The food caused abnormal fermentation, and a pool of infection was set up, and as a result of irritation of the bowel, loose stools, even diarrhœa, resulted. A further type was dyschesia.

Diphtheria Immunisation in Manchester.—In regard to the scheme for immunisation against diphtheria introduced in October, 1928, the report to the Manchester Public Health Committee of Dr. Veitch Clark, M.O.H., shows that, in all, 3745 people had been treated up to last December. Four people contracted diphtheria before they had received the requisite number of injections, but there was no instance of a fully immunised person suffering from the disease. No serious reactions or ill-effects had occurred among any of the patients, nor was there any appreciable effect upon attendance at school of the children who were treated. The treatment had been provided free at certain institutions, and in all schools, and in addition the necessary material was supplied freely to 19 general practitioners for private use.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.

A MEETING of this Association was held on Jan. 28th at the British Medical Association House. In the absence of Miss FRANCES HUXLEY, the President, the chair was taken by Miss ELIZABETH BOLTON. A discussion on the

WORK OF MEDICAL WOMEN IN INDIA

was opened by Lady BARRETT. She outlined the development of the work since the time when Dr. Swain, of New York, joined two missionaries who had begun to train orphan girls in physiology and hygiene. Dr. Swain added to their training some knowledge of medicine, nursing, and compounding, and probably her pupils were the first Indian women to be trained in nursing and dispensing. British medical women followed later, and the sufferings of purdah women led Queen Victoria to command Lady Dufferin to do all she could to relieve the situation. Lady Dufferin collected money from Indian princes, and thus formed the Association which long bore her name, and which in 1913 became the Women's Medical Service of India. The proposal to constitute an official Women's Medical Service, corresponding to the I.M.S., was at this date finally rejected, but the Government sanctioned a subsidy to enable a Women's Medical Service to be carried on by the Countess of Dufferin Fund. With this meagre concession the Service had struggled to carry on, but the position to-day was that the funds barely justified the support of the 42 medical women in the Services and of the hospitals which rely on the Fund for upkeep. The difficulty in obtaining an adequate subsidy from the Government arose from the present constitution of the Service, since medical aid is one of the departments relegated to the provincial governments. The Government of India refused to concern itself with the support of the Fund, and unfortunately the Provincial Ministers tended to pursue a policy of economy which did not allow of efficient grants for medical services. Money was spent on the promotion of the indigenous system of medicine, and hospitals were built without ensuring that sufficient funds were available for fully qualified medical women to be put in charge of them. Moreover, even in the areas which are under the direct administration of the Government of India, the Indian women, and especially the purdah women, were most inadequately served. The Association of Medical Women in India endeavoured to make these areas a special charge, but it could do very little when it was faced at the same time with the need of supplying and preparing medical women for professional appointments and with the charge of hospitals for women in the various provinces. It was now urgent that the Medical Women's Services in India should be put on a proper basis. The unwillingness of provincial governments to appreciate in any way the desirability of making grants for medical work for women was illustrated in the Cama hospital in Bombay, where many reforms were necessary, and in the Agra Hospital for Women. In connexion with the latter hospital Dr. Margaret Balfour had contributed a letter to an Indian paper, in which she pointed out that the Government had recently installed electric light in the mental hospital, but had persistently refused to do so in the Women's Medical School and Hospital. One night recently a uterus was removed, two Cæsarean sections were performed, an appendix was removed, and five mothers were delivered naturally, all by lamplight. That the Government would provide light for criminal lunatics while withholding it from these unfortunate mothers indicated, in Dr. Balfour's view, that the omission was not due to lack of money but to the slackness of the authorities when the matter of the benefit of women only was concerned. She pleaded that hospitals run by men and women should be placed on an equal footing as regards staff, equipment, and appliances, the only criterion being the importance of the work done in each place. Efforts for the improvement of medical work and education were going on in various parts of India, but the danger was that even fine buildings might be coupled with efficient equipment and personnel, still more probably with inefficient nursing.

Lady Barrett proceeded to consider how this enormous problem should be tackled. Most medical women who had worked in India were agreed on the importance of the appointment of a fully trained medical woman in each province to hold a position at least as high as that of assistant director. Such a woman should be in a position to organise work for maternity and child welfare, and later to connect it up with hospital work. Many people who had studied the question considered that a useful first step would be the appointment of such a medical woman, and also one in charge of a central fund from which grants might be made to the provinces. Ultimately there might be established a revised Indian Medical Service for men and women with equal pay and privileges. This scheme was favoured by many of the younger medical women working in India, but it might take years to come. Another idea was that, side by side with the I.M.S., an official women's medical service should be recognised, with members adequately paid. The first step suggested by Lady Barrett would be a suitable beginning to either of these schemes. The difficulty would be the finding of the money. In her view, the principle of a grant, equal to the amount raised by the local authorities, would be successful in India as it has been in England. Provincial governments might be willing to spend 50 per cent. on work done by voluntary agencies or recommended to them by a woman medical officer of standing if a central source of supply provided the other 50 per cent. Indian women were taking part with enthusiasm in child welfare work. Lady Barrett believed they would support with equal enthusiasm proposals for a unified women's health service for India.

Discussion.

Dr. ANNETTE BENSON quoted statistics showing the inadequacy of the provision of medical women, nurses, and hospitals for women patients in India. It was almost impossible for those who had never been in India to realise the vast expanse of country inhabited by illiterate people, all as ignorant of hygiene as the goats and rats who lived with them. A favourable sign was the real interest which had recently been aroused in child welfare work and health exhibitions. Individual enterprise could not fill the need; medical women must be organised in the Government service, for their own protection, and to keep their work up to standard.

Dr. TURNER WATTS said that the Indian women who had entered the medical profession were, for the most part, engaged in private practice, where their quiet unostentatious work had had an influence on many homes, and must not be forgotten in any estimate of what had been accomplished. These Indian women, as well as those working in medical missions, and, indeed, nearly all those who had worked in India, had found clinical work so exacting that little time or strength was left for anything else. A few had achieved great success in teaching, notably in the Lady Hardinge School and Hospital, but in certain directions further development was required, especially in pathology and research, and in preventive medicine.

Dr. NAWAL KISHORE spoke of the conditions in country districts and small towns. The majority of maternity cases were conducted by the indigenous dais, who were illiterate and ignorant women. The profession of Traditional Dai was handed from mother to daughter or from mother-in-law to daughter-in-law. These women had no idea of asepsis, and their methods of conducting labour were very crude. Attempts were made to improve the indigenous dais by training, but the majority who attended classes were over 50 years of age, too old to understand or grasp anything new. They were intolerant of aseptic methods, and it could well be understood that one year's training did not lead them far towards acquiring the desired standard of work. After this training they were given a certificate written in a language which they did not understand testifying to their efficiency in midwifery. With this certificate they were well fortified to defend themselves. Dr. Nawal Kishore held that it was imperative to establish an efficient service for the teaching and training of midwives who should all be of a higher standard than those who had hitherto presented themselves. At the very least they should have a reading and writing knowledge of their own vernacular. She begged that medical women who desired to render service to the suffering women of India should use their influence to raise the standard of efficiency in the training of midwives in that country.

Dr. V. PILLEY gave some account of the Lady Hardinge Medical College and the organisation for training medical students.

Dr. B. NATARAJAN commented on the good feeling between men and women medical students in India, and stressed the importance of employing Indian medical women for work among Indian women. Sometimes European medical women attempted to work among the people without having studied their language, and naturally they could not gain the confidence of their patients.

Mrs. RAMA RAO spoke from the point of view of a social worker. She appealed for the formation of some scheme which could be considered and supported by the All-India Women's Conference. The great thing was the teaching of sanitary conditions in villages and the training of more dais for maternity work in outlying districts. These dais worked for a wage of a pound per month, and the immediate provision of many trained dais would be of greater benefit to the women of India than the slow organisation of a highly efficient service. In her view it was important to keep the indigenous dais, even if they had to have a two years' training instead of one. This hereditary profession was a factor of life in India which could not be ignored, and no efforts must be spared to make it efficient.

Reply.

Lady BARRETT pointed out that the proper training of midwives depended on an efficient maternity hospital, staffed by expert medical women, where midwives could see labours conducted under good conditions. It also implied a service of medical women who could show them how to adapt their training by midwifery work in the patient's own home. It was for this reason that she considered that the best method of advance was by the appointment of medical women to the provincial governments as directors of maternity and child welfare.

LIVERPOOL MEDICAL INSTITUTION.

AT a meeting of this Institution on Feb. 13th Mr. C. THURSTAN HOLLAND and Dr. J. M. W. MORISON (Edinburgh) opened a discussion on

Radium in the Treatment of Malignant Disease.

Mr. HOLLAND began by saying that radium never had been and never would be the cure for cancer. Radium, like the knife and diathermy, was essentially a local remedy and no merely local attack could ever be entirely successful. Methods of raising money had unfortunately led the public to believe that, given enough radium, cancer need no longer be feared. The published statistics were unreliable in estimating the real results. The term "cure" should not be applied to the so-called five years' cure; in the large majority of cases the mere removal of a tumour was not enough, a general infection had already taken place, and it was merely a matter of time before some kind of protection gave way and recurrence or metastases followed. Considerably over half the yearly deaths from cancer were from disease of the gastro-intestinal tract and its appendages, and this could not be a very hopeful field for radium treatment.

Dr. MORISON said that the National Radium Commission did not regard the question of the use of radium in the treatment of cancer as one that was settled, but rather that the subject was one which called for careful inquiry. The trend of radium therapy in the great continental centres, he thought, was the avoidance, whenever possible, of the direct introduction into the tissues of tubes and needles, the line of advance being the development of the surface applicator, designed in such a way that the distribution of tubes and needles on the outer surface gave what was for all practical purposes uniform irradiation of the skin surface. He regarded the work of Murdoch and Stahel at l'Hôpital Burgmann in Brussels as a genuine advance. Radium therapy was still in the experimental stage, but the results obtained justified its use and justified further research, both clinical and experimental.

Mr. G. C. E. SIMPSON thought the openers had taken far too pessimistic a view, that the experience of surgeons in the diagnosis of cancer and of the results which might be obtained in individual cases was such that it should not be eliminated by introducing a new class of specialist, the radiological expert on cancer. While agreeing that in every centre the surgeon should be able to seek the advice of such experts, he considered the surgeon was justified in using radium if he had made himself familiar with the results obtained and the treatment used in the great surgical clinics which had advanced radium treatment in recent years. Such treatment in operable cases had the advantage of saving mutilating operations, and there were many places, such as the floor of the mouth, where radical surgery of cancer was not only highly dangerous but almost hopeless and where radium treatment gave at least great ease and in many cases apparent cure. After all, whatever the dangers of inexperienced treatment, cancer itself was a fatal disease.

Mr. F. STRONG HEANEY held that Mr. Holland had proved his thesis that radium was not "the cure" for cancer, but surgeons and gynæcologists had really not an exaggerated or false idea of the value of the remedy. Under the present voluntary hospital régime appeals for funds must be made by laymen, and were, in fact, made without reference to medical men. The profession itself was fully aware of the limitations of this very valuable weapon in treating cancer. Objection had been taken to the five years' standard of non-recurrence, but the only way to compare results was to adopt some standard of comparison, be it five years or otherwise. Cases must be selected by someone in a position to judge the possibilities of surgery. The collaboration of the radiologist and the physicist was, of course, indispensable. Whether in the hands of surgeons or radiologists methods were still largely empirical. As between radium and deep therapy radium would be preferred until more and better results from deep therapy were recorded.

Dr. RAWDON SMITH, whilst agreeing that certain of the methods for raising money were much to be deprecated, hoped that nothing Mr. Holland had said would prevent the public subscribing for radium in Liverpool, where both research and radiotherapy were behindhand.

Mr. PHILIP HAWE said the estimation of the dosage of radium in terms of ergs, although ideal, seemed to prevent many difficulties. In the case of superficial tumours it was a time-consuming calculation, but with deep tumours whose size could not be accurately determined it did not appear of much value to him. The bomb treatment was justifiable only in the most expert hands and as even then it was both dangerous and of doubtful value it was unlikely that it would ever come into more general use. Mr. Hawe had been much impressed during a visit to Brussels by the importance of having at one's disposal for the treatment of malignant disease all three methods—radium, surgery, and X rays—if the best results were to be obtained. For instance, carcinoma of the rectum was probably best dealt with by a preliminary colostomy, then radium after eight days and in two months' time a perineal resection (Newman and Coryn). The results were better than those of surgery alone and far better than could be hoped for with radium alone. Operable breast cases were dealt with by a preliminary course of X ray therapy, then operation on the usual lines, and finally another course of X rays. In inoperable cases and superficial recurrences radium was used, and for the deep recurrences X rays were used. With extensive irradiation regular blood examination was of great importance; leucopenia was a danger signal.

Prof. W. J. **Dilling** said that from personal knowledge of beneficial results at the Radium Institute in Paris he was convinced that further supplies of radium were necessary in Liverpool in order that patients might not be denied the relief and benefit which this therapeutic agent could afford in certain types of malignant disease. In Liverpool, with its complexity of hospitals, he felt that the ideal system for the effective utilisation of radium was the establishment, under the supervision of the University, of a radium institute where a directing medical officer, specially trained in the physics and modern technique of both X ray and radium therapy, could guide surgeons as to the dosage and methods most promising of success and could organise research with a view of improving technique and results. The present policy of the Radium Commission to lend radium to only one hospital in an area was not, in his opinion, designed to facilitate the use of this therapeutic agent for the most deserving and appropriate cases.

Dr. C. O. **Stallybrass** inquired what was the best way of securing the coöperation of the surgeon and the radiologist and whether the Radium Commission were taking any steps to place the training of radiologists in the treatment of cancer on a sound basis.

Mr. **Frank Jeans** said he did not consider Mr. Holland and Dr. Morison pessimists. They were simply telling the truth—that the treatment by radium or by surgery was productive of equally good or bad results. Radium had not yet supplanted surgery. Naturally patients preferred radium, but the position was that there was a great deal of cancer and very little radium and surgeons were forced to operate nearly as much as ever. The extravagant claims for radium were perhaps (but he did not admit this) partly pardonable because it was known that the public would not subscribe for research, but would for a promise of cure.

Mr. **Holland** and Dr. **Morison** replied.

Protrusion of the Mandible.

Mr. G. C. E. **Simpson** and Mr. H. G. **Watkin** described a case of protrusion of the mandible in a man of 28. His lower teeth were 19 mm. anterior to the upper and he was unable to eat well and ashamed to eat in public. The condition, they said, is in some cases congenital and in others caused by finger sucking or early loss of temporary incisors—leading to the lower teeth getting too far forward. Once started it tends to increase from mechanical causes unless checked and dental measures are most valuable before the loss of the deciduous molars. Angle and Whipple have devised an operation of division of the mandible on both sides at about the level of the premolar teeth, but there are objections to it—namely, first the injury to the inferior dental nerve in the canal and its effect on the front teeth, and secondly the probability of sepsis. Bruhn, of Düsseldorf (as a result of coöperation of dental surgeon and surgeon in military orthopædic surgery), relieved the condition by resection of the mandible below the notch but above the inferior dental foramen by a subcutaneous osteotomy, and this operation has also been performed by Babcock in Philadelphia. In the case reported this method was chosen and Mr. Watkin first fitted cap splints to the jaws, packing the splint to lever the jaw into the best position as studied on models of the patient's bite, and the osteotomy was performed. After six weeks in the splints it was found that the upper posterior molars locked the bite and that the incisors did not meet. After extraction of these teeth and grinding down of some posterior teeth which had never met and been worn to the pattern of their opponents the patient was left with sixteen teeth in good occlusion. The patient was now able to eat satisfactorily. Photographs and models were shown and emphasis was laid on the advantage of the surgeon and dental surgeon coöperating from the start in deformities and fractures of the jaws.

HARVEIAN SOCIETY.

Streptococcal Infections.

A meeting of this Society was held at Paddington Town Hall on Feb. 20th, with Dr. P. **Montague Smith**, the President, in the chair.—Dr. C. **Bruce Perry** read the Buckston Browne Prize Essay. The problem of the streptococcus as a causal factor in disease, he said, had not yet been satisfactorily solved, and it was impossible to say whether the multifarious illnesses connected with streptococcal infection were entirely strain-specific or not. The recent work of Birkhaug and Small gave further support to the hyperergy hypothesis according to which a sensitised person was liable to react briskly to further doses of streptococcal infection. Dr. Perry thought the portal of entry, the condition of the patient, and the series of illnesses to which this individual had been previously subject played a large part in determining what type, if any, of chronic streptococcal illness he was likely to develop. Further research work could be more satisfactorily directed to the consideration of the patient's condition than to the identification and differentiation of the various types of streptococci. Focal sepsis itself did not seem to play a large part in this type of illness. There was no proof, even if a patient did recover after the removal of the focus, that such was the primary cause; for in all probability the improvement was due to the general improvement in the patient's resistance. Consequently, it was more important to consider his metabolic type, the illnesses from which he had previously suffered, and the way in which he reacted rather than to concentrate upon the type of organism with which he was infected.

Dr. R. **Cove-Smith** said he was entirely in agreement with Dr. Perry about the importance of the individual as compared with that of the organism. Absorption of toxic products lowered the resistance of the patient, thus leading to spread of local infection and involvement of other organs of the body. As a result of this spread from the primary focus, secondary lodgement might occur, and it was at this stage that focal sepsis became important; for where previous sensitisation had taken place, widespread results might follow. The work of Parish and Okell suggested that the various streptococcal infections were due essentially to the same species of bacteria. The pathological effect varied with certain factors, mainly quantitative, such as invasiveness and toxicity on the part of the strain, and local or general susceptibility on the part of the host. The chemical make-up and metabolic pattern of the patient were of manifest importance. Thus streptococcal infection which in a normal individual might give rise to a secondary anæmia, would tend to produce pernicious anæmia in those with defective bone-marrow, or subacute septic endocarditis in those with an incomplete endocardium and damaged heart valves. Apparently the main factors involved were: (1) The virulence of the organism. Hæmolytic streptococci tended to produce acute illness. (2) The amount of toxic absorption. (3) The resistance of the patient. It was upon this factor that the neutralisation of toxin depended. Consequently, endocrine deficiency, dietetic errors, disorders of metabolism and previous illness were of extreme importance in the development of chronic streptococcal illnesses.

Reviews and Notices of Books.

THE PROBLEM OF SLEEP.

Der Schlaf: Mitteilungen und Stellungnahme zum derzeitigen Stande des Schlafproblems. By Prof. PÖTZL, Prof. v. ECONOMO, Prof. PICK, Dozent Dr. MOLITOR, and Prof. STRASSER (all of Vienna). Edited by San-Rat. Dr. SARASON, Berlin. Munich: J. F. Lehmanns. 1929. Pp. 107. M.5.50.

IT is perhaps characteristic of present-day research that books and monographs dealing with a selected medical subject, touching different circles of study, or offering different aspects deserving attention, seem to be forthcoming in ever-increasing number. To decry team-work is out of date, if not reactionary; but there are times when we feel that the heart of a problem is not to be attained by skirmishes on its outskirts. To discover the route that leads to the core of the problem concerned is worth more than to explore neighbouring lines of investigation which may in the end prove to have led nowhere. Such thoughts are aroused by perusal of a learned symposium on the question of sleep, contributed to by distinguished authorities of the Vienna school, and dealing in the comprehensive German manner with its biology, physiology, pharmacology, and treatment. Sleep is discussed as an energic problem, as a psychical problem, as a problem in localisation, in circulation, in excitation, and so forth. All is very well done indeed, and for those who are already oriented in the subject the various points of view of the writers prove illuminating and instructive. But we miss a synthesis in the midst of so much analysis; we should have liked the editor to summarise arguments and set out conclusions. For example, since Prof. v. Economo draws attention to the fact that decerebrate animals and anencephalic monsters (lacking in part at least the optic thalamus) exhibit periodic change between waking and sleeping, we wish to know the bearing of this on Prof. Pötzl's general discussion of sleep as a question of the psyche. Reconciliation is wanted, and may indeed be apparent to the informed; but none the less it is missed from this work. Prof. v. Economo argues stoutly for the existence of sleep centres capable of anatomical (i.e., spatial) localisation, but yet is compelled to allow that not all disorders of sleep function can possibly be ascribed to them alone. Sleep cannot have its ultimate cause in the nervous system but only its regulation, and in fact only part of that.

The book is somewhat marred by an inordinate use of italics and italicised sentences.

PROGRESSIVE RELAXATION.

A Physiological and Clinical Investigation of Muscular States and their Significance in Psychology and Medical Practice. By EDMUND JACOBSON, A.M., Ph.D., M.D., the Physiological Laboratory, University of Chicago. University of Chicago Press. 1929. Pp. 428. 22*s.* 6*d.*

THE title of this book scarcely indicates its contents; if "progressive relaxation" smacks of the plausible therapeutist whose knowledge of the anatomy and physiology of the nervous system is minimal the reader will be most agreeably surprised by the thoroughly objective and experimental standpoint of its author. There is much more in these pages than a scientific technique for obtaining muscular rest; they range over many problems of the motor system, inclusive of muscle tonus, the neural regulation of muscular contraction, the relation of the emotions to the somatic and visceral musculature, and others of abiding interest to the practising neurologist.

Dr. Jacobson supplies a detailed description of his methods for enabling the subject to relax properly and completely—so absolutely, indeed, that he has on several occasions been able to demonstrate abolition of the knee-jerk, although the person experimented with is not in point of fact asleep. This is clearly a phenomenon of considerable significance, since it appears to prove that little by little (for the procedure takes a certain time) the musculature can be so emptied of tone by voluntary inhibition that reflectivity is temporarily interrupted. It throws light on the loss of the knee-jerk in sleep, in narcolepsy in cataplexy, and compels the student of the question to revise current conceptions of the relation of symptoms to lesions. For here is loss of the reflex as pronounced as if the dorsal columns of the cord were sclerosed. Believing that the commonplace complaint of the nervous and neurasthenic patient that he is in a "state of nervous tension" deserves acceptance at its face value, Dr. Jacobson applies his technique in such cases with a view to counteracting, or doing away with, certain activities which place an undue tax on the organism. He believes the method possesses obvious advantages over drug therapy, and illustrates its appropriateness by a series of cases of acute and chronic neuromuscular hypertension (worry, anxiety, restlessness, inability to concentrate, emotional imbalance, stuttering, compulsions, and psychasthenic syndromes). Judging by his reports, intensive rest of a thorough-going physiological kind merits full trial.

A good bibliography adds to the usefulness of a book which is distinguished throughout by its scientific setting and which reveals impressively the cautions and critical spirit of its writer.

PHYSIOLOGY.

Essentials of General Physiology. By ERIC PONDER, M.D. D.Sc., Professor of General Physiology, New York University. London: Longmans, Green and Co., Ltd. 1929. Pp. 497. 15*s.*

ALTHOUGH this book is primarily meant for medical students who have passed their first examinations in chemistry and physics, the author does not rely upon more than an elementary knowledge of these subjects, so that his book should be interesting and attractive to a wide circle. In the first five chapters the physico-chemical foundations on which physiology rests are discussed in a readable manner. The latter portion of the book deals with certain aspects of physiology—muscle and nerve, secretion, digestion, respiration, circulation—in general terms, theoretical discussions being avoided. The medical reader of these portions of the book will be conscious of a mild dissatisfaction, probably due to the deliberate bar against controversial matters. The book is, however, an excellent one on the whole. Minor points which call for criticism are the excessively small print used in the index and the almost complete lack of detailed references to individual work. The author has purposely refrained from mentioning individual investigators by name; in our view this is a mistake, for whether a piece of sound experimental work is old or new, it is always stimulating to read the individual worker's own account of the problems he has tackled and of the methods he has adopted to meet them.

Applied Physiology. Third edition. By SAMSON WRIGHT, M.D., M.R.C.P., Lecturer in Physiology, University of London, King's College. London: Humphrey Milford, Oxford University Press. 1929. Pp. 552. 18*s.*

IN the third edition of this book no changes of structure have been made, but accounts of new work have been included. Amongst the additions are sections on conditioned reflexes, chronaxie, the separation of pituitrin into two components, oxytocin and vasopressin, œstrin, Zondek and Aschheim's pregnancy test, and the modification in the structural formula attributed to glutathione.

At the present time when vast amounts of work are being poured out from laboratories all over the world it is becoming difficult to deal adequately with, and assess the value of, the drops that make up the stream of fresh investigation. Dr. Wright has, however, managed to note much new work, though some of the recent advances are dealt with rather briefly. For example, in the section on the ductless glands no mention is made of the recent production by T. F. Gallagher and L. C. McGee of active testicular extracts, or of the work of G. W. Corner on the corpus luteum, and his production of an active extract capable of replacing the ovary in early pregnancy. In the chapter on carbohydrate metabolism the cause of diabetic coma is ascribed principally to the accumulation of aceto-acetic acid in the blood. This belief is not now so confidently held as the reader of this account might be led to believe. The book is a fine piece of work, on which Dr. Wright deserves congratulation.

A System of Surgery.

Die Chirurgie. By Prof. Dr. M. Kirschner and Prof. Dr. O. Nordmann. Lief. 25. *Die Chirurgie des Gehirns und seiner Häute.* By Prof. Dr. Egan Ranzi, Innsbruck. *Die Chirurgie des Vegetativen Nerven-Systems.* By Prof. Dr. F. Bruning and Prof. Dr. O. Stahl. Berlin: Urban and Schwarzenberg. 1929. Pp. 608.

This section of Kirschner and Nordmann's large system of surgery achieves the high standard of performance which former volumes have led us to expect. It gives a sound, though not elaborate, account of brain surgery in which the different parts of the subject receive adequate attention. Prof. Ranzi has not described neurological diagnosis in great detail, since he regards this as the province of the specialist. His attitude towards the relation of surgery to neurology is hardly one to be encouraged, for history of this branch of work especially has shown that the surgeon has advanced here, as elsewhere, in proportion as he has become more medically and physiologically minded. Prof. Brüning and Prof. Stahl have dealt successfully with a very difficult subject, steering clear of unwarranted enthusiasms and yet not withholding information the reliability and value of which only future experience can determine. The benefits that can be expected from periarterial sympathectomy, and such experimental operations as those of John Irvine Hunter and N. B. Royle are set out with admirable judgment. Altogether the volume is well worth study.

A Manual of Mendelism.

Second edition. By James Wilson, M.A., B.Sc. London: A. and C. Black. 1929. Pp. 143. 4*s.* 6*d.*

An admirably clear and cheap account of Mendelism intended primarily for agricultural students and dealing mostly with stock breeding. By some fad of the author, there is no mention of chromosomes or genes; it is interesting to see that the facts can be so well stated in terms of themselves, but the confirmation of genetics and cytology by one another has surely been one of the most impressive achievements of modern biology, of which students should at least hear a little. However, no one who wants to know the principles of Mendelian inheritance can do better than to get this book, which contains a good deal more information than its number of pages may suggest.

The Chromosomes in Man.

Sex and Somatic. By Herbert M. Evans and Olive Swezy. University of California Press. 1929. With 11 plates. Pp. 41. 6*s.* 9*d.*

The difficulties inherent in all investigations into the character and behaviour of chromosomes have hitherto made the subject to some extent inaccessible to the cautious worker in other fields; he has felt that only the specialist, with an intimate knowledge of the technique of the processes involved, was in a position to judge of the probable accuracy of the facts so freely quoted in the literature of heredity. This hesitancy has been fostered by the conflicting evidence which is inevitable in the early days of a new line of investigation, whilst methods are being tested and technique is being developed and elaborated. This study by Evans and Swezy will do much to bring the subject more within the scope of other workers. The authors are to be congratulated on the clearness of their description and on the critical attitude they have maintained throughout with regard to their experiments; the very illuminating plates and illustrations, too, are of great assistance in giving a clear conception of the work and its great possibilities. There is evidently a vast field awaiting exploration. All original measurements are given, to the great advantage of those who desire to judge for themselves what is the significance of conclusions drawn from them.

Several years have been devoted by the authors to the preparation of this memoir; they should be rewarded by a widespread appreciation of its value.

History of Medicine.

The Canon of Medicine of Avicenna. Incorporating a Translation of the First Book. By O. Cameron Gruner, M.D. Lond. London: Luzac and Co. 1930. Pp. 612. £2 2*s.*

All interested in the history of medicine will be grateful to Dr. Gruner for this informing and beautifully produced book, and no one can read his description of the relations between the Canon of Avicenna and modern thought, or his exposition of the knowledge presented by the Canon, without appreciating that the work has been one of intensely applied labour and that the labour was one of love.

In the history of medicine the tenets of Islam played a highly important part which this book compels the reader to recognise. As far as our science is represented in literature, Hippocrates was the founder of medicine, the Alexandrian School as typified by Erasistratus and Herophilus made valuable additions, and Galen, writing in Greek and summing up for Rome the Greek wisdom, accepted the precepts and dogmas of Hippocrates; and although more recent knowledge tempted Galen to make additions, his new learning seduced him into the development of theories and hypotheses which he was unable to support. Galen died when the Roman Empire was at the height of its splendour, and on the Dark Ages which followed Roman scientific research made no impression, and at best its impetus was never a strong one. The history of medicine stopped short with the barbarian invasions of the far-flung Roman boundaries, and such culture as survived fell into the hands of the Christian Church which was perpetually in conflict with itself. It is in the Islamic revolt from Christianity that the line of progress is to be found. Mahomet was born in A.D. 570 and was certainly aware of the Christian writings for he borrowed from them. The rapid spread of Mohammedanism over the parts of Asia and Africa contiguous to Europe, and various successful military invasions, brought the culture of the Arabians, as it developed, into touch with Western peoples. During the long period when little or nothing was added to the scientific wisdom of a Europe represented by the bewildered Roman provinces, transformed and rearranged under waves of invasion, the Arabians kept medical knowledge from complete submersion. Haroun al Raschid, who synchronised approximately in English history with Alfred the Great, founded a hospital and medical school in Bagdad, and between A.D. 850 and A.D. 927 three Arabian physicians made their indelible marks, Rhazes, Abbas, and Avicenna, of whom the last was the greatest, and for some four centuries his Canon was regarded as containing infallible doctrine.

Dr. Gruner's treatise on the Canon incorporates a translation of the First Book, and in this translation we can see what a mass of learning was brought together by the famous Arab, and can forgive as well as be amused at the elaborate therapeutics, because of the really philosophical insight that characterises the whole work. "The place for Avicenna in modern thought," says Dr. Gruner, "is gained when it is agreed that he shall be viewed as one who entered this world entrusted with a mission independently to express for that age, by means of those various tools which he then found in it, the wisdom which is unchanging and impersonal." This sentence contains the gist of a wise chapter on the nature of the knowledge presented by the Canon, and of a further section pointing out the basic difference between the Canon and modern medicine. The Canon treats of speculative medicine on the grounds that the whole of the Universe is the manifestation of the universal principles of life acting through the instrument of certain forms. Modern medicine strives to obtain the rank of a positive science, and in doing so is compelled to exclude from its fundamental principles philosophical speculations, which constitute the very essence of the matter for Avicenna. Dr. Gruner summarises for us the conceptions known to modern medicine but not to Avicenna, as well as the knowledge common to Avicenna and modern medicine, and concludes his prefatory remarks with the following passage: "In the intention of this work, then, there comes into consideration that greater Art of Medicine—not an ethical Hippocratic ideal, but something of the divine—an Art as real to Avicenna, philosopher, poet, musician, the worker among the great and the small, aware of the dramatic in Life as it should be to us. So we step out of the world of the modern critic, the scholar, and the medical historian, indeed of modern medicine itself, into one in which we stand, as it were, hand in hand, with the great Master of the East—almost with his very eyes gazing upon and scrutinising this ever open book of Life of ours—divested of the false notions of 'progress' and 'time.'" Read in the spirit which the learned translator and commentator thus suggests to be the right one, the whole Canon becomes of absorbing interest, while the modernity of some of the injunctions is all the more stimulating by their proximity to other injunctions, due to the exaltation of traditional rumour into exact experience. Throughout the translation Dr. Gruner makes profuse and wise reflections, when the references to the far-ranging literature referred to are carefully given.

The translation is made from the Latin version, signal help being acknowledged by the author, in respect of the Arabic, Persian, and Chinese essential to his purposes, from the School of Oriental Studies, London Institution (University of London).

Le Adiposità Patologiche.

By Prof. Giovanni Poggio, of the Institute of Clinical Medicine, University of Genoa. Bologna: L. Capelli. 1929. Pp. 315. L.40.

This work has a preface by Nicola Pende, professor of clinical medicine at Genoa, who praises it as a painstaking treatise compiled with great competence and diligence. In his view the conclusions arrived at represent the greatest possible progress in the elucidation of a disease which shortens the life of a very large number of people; there can be no doubt of the painstaking labour which has gone to their compilation.

In the chapter on the pathogenesis of adiposity the author sums up the results of his researches. Acquired adiposity, that which is due to idleness or over-feeding, is, in a large measure, consequent on a neuro-endocrine habit already established in the individual, and some cases are determined by acquired lesions of the thyroid. The adipogenetic factor is not always limited to the one endocrine gland principally affected, but may result from the sum total of functional disorders introduced into the neuro-hormonic equilibrium by the functional defect of the organ primarily implicated. The pituitary is a frequent cause of acquired adiposity with well-marked differential characters which are especially prevalent during the first ten years of life. A prevalent pathogenic factor also is the posterior pituitary lobe which regulates the mechanism of fat metabolism. The origin of some adiposities in which the genital gland is often solely incriminated is still uncertain, but hypogenital or agenital adiposity presents clinical features easily appreciable and useful for differential diagnosis. But the tendency to fat in the hypogenital or in young castrates does not run parallel with an habitual or constant elimination of oxidation—the two factors being entirely dissociated; the cause is really a concurrent hypofunction of the thyroid or a functional recrudescence of the thymus. This explains why adiposity is not found in some cases of hypogenitalism and castration; individual factors and endocrine interaction regulate the reaction of each organism to the genital functional suppression.

Prof. Poggio found in his cases that the respiratory exchange while fasting showed no fixed behaviour, and he thus excludes the possibility of an interdependent relation between diminution of oxidation and adiposity of thyroid origin. The same may be said of the specific caloric value of foods. As regards the pathogenesis of constitutional adiposity, there is a large group of adiposities, prevalent in youth and due to functional inadequacy of some of the endocrine glands (pituitary, thyroid, genital, and suprarenal) which induce certain conditions in the regulation of caloric exchange. There is a group which is dependent on hyperfunction or hyperplasia of other endocrine glands such as the suprarenal cortex, pancreas, and genitals in man and the corpus luteum and mammæ in women; and further, there are adiposities in which the endocrine factor plays a less relevant part and where the constitutional disorder is confined to the cellulo-adipose tissue—lipotropism or lipophilia. The most interesting chapter in the book is devoted to the clinical varieties of adiposity, including Dercum's disease, the syndrome of Launois and Bensaude, and neurolipomatosis dolorosa of Recklinghausen. Therapeutic measures receive rather scanty treatment. In a bibliography of 426 references, chiefly from German and Italian sources, British names are conspicuously absent, showing perhaps that the subject of adiposity has not received so much attention from scientists in this country as from those abroad.

A Manual of Pharmacology.

Seventh edition. By Walter E. Dixon, M.A., M.D., B.S., B.Sc., D.P.H., F.R.S., Sometime Professor of Materia Medica and Pharmacology at King's College, London; Assessor to the Regius Professor of Physic, and Reader in Pharmacology, Cambridge. London: Edward Arnold and Co. 1929. Pp. 486. 18s.

For the benefit of those who are approaching the subject of pharmacology for the first time we may state that Dixon's text-book is recognised as a standard work on the subject, and that the name and reputation of the author are guarantees that any new addition will present the most up-to-date information, carefully considered and cogently expressed. The book contains not only a complete account of the action and uses of drugs, but deals with a number of allied subjects such as antitoxic sera, vaccines, radiotherapy, and radium. For a generation this work has held its place as one of the best of the text-books of pharmacology, and this seventh edition is not likely to be less popular than its predecessors.

A Study of Tuberculous Cavities.

Étude clinique et radiologique des cavernes tuberculeuses. By Dr. Jaquerod (Leysin). Paris: Masson et Cie. Fr.16.

This monograph, coming from the Leysin clinic, is of particular interest. It deals with those circular shadows which occur in the lung fields and look so convincingly like cavities. There are only ten pages of letterpress and illustrations of some 40 cases. The author discusses the interpretation of these circular shadows from the radiological and clinical aspects, and classifies true cavitation into three degrees. He shows that all three degrees may undergo a process of healing, and their radiological appearances disappear. There are some good examples of pseudocavity shadows among the illustrations, all of which are extremely well reproduced and are accompanied by excellent descriptions which amplify the text.

This is an important monograph, and throws new light on the interpretation of these difficult shadows. It should be in the hands of all those interested in the radiological investigation of the lungs, and particularly those who are doing sanatorium and tuberculosis work. It is very well produced and reasonable in price.

DEFINITION OF DRUGS FOR THE PURPOSES OF MEDICAL BENEFIT.

REPORT OF THE ADVISORY COMMITTEE.

THE Advisory Committee on the Definition of Drugs for the Purposes of Medical Benefit, whose second report was briefly summarised in our columns last week, was appointed by the then Minister of Health, in February, 1929, and consisted of Dr. Dudley G. Greenfield (*Chairman*), Mr. T. Allsop, Dr. J. J. Day, Sir Walter M. Fletcher, F.R.S., Mr. J. E. French, M.P.S., Dr. A. F. Heald, Mr. W. Gill Hodgson, Dr. E. Lewis Lilley, Mr. F. Llewellyn-Jones (who resigned and was replaced by Mr. J. E. Tomley, in November, 1929), Mr. G. A. Mallinson, Mr. Edwin Potts, Mr. Philip F. Rowsell, F.C.S., Mr. Thomas Tickle, F.I.C., with Miss E. M. R. Russell-Smith, of the Ministry of Health, as Secretary.

Their terms of reference included the distribution of 165 substances and preparations submitted to them into certain categories, depending on whether the particular substance of preparation was, in their view (*a*) never a drug, (*b*) always a drug, (*c*) sometimes a drug. They concluded that this classification was too simple, since certain preparations, though admittedly drugs or medicines which in appropriate circumstances should be supplied to insured persons at the cost of the Chemists' Fund, yet, from their nature and cost should only in exceptional circumstances be prescribed in preference to other substances and preparations of reputed analogous therapeutic effect. They found it convenient, therefore, to allocate the substances and preparations referred to them among six different categories—namely, Classes A, B1, B2, B3, C1, and C2.

Never a Drug.

Class A contains substances and preparations which, in the opinion of the Committee, are never drugs. In this category are placed :—

Acidophilus milk, albulactin, Allenbury's food, ambrosia, arrowroot, Benger's food, bovinine meat juice, bovril, Bragg's charcoal biscuits, Brand's essences, brandy, bulgarlac, calves' foot jelly, cane sugar, Carnrick's peptonoids, casein food, casumen, ceregen, cerolia cream, champagne, chymol, coffee, diabetic bread and biscuits, energen bread and biscuits, glaxo, glaxovo, gluten bread, glyco-lactophos, herogen, Horlick's milk, hi-g-ah tea, ice, instant postum, iodised salt, lactic milk, lacto-dextrin, lactogen, lactose, lemco, mabela, marmite, meat extracts (other than liver extracts), meat juices, Mellin's food, melovol, midolia biscuits, Muller's nutrient, new-promonta, numol, nutrient suppositories, oatmeal, ovaltine, oxo, panopepton, pearl barley, peptonising powders, plasmon, plasmon oats, Robinson's barley and groats, roboleine, saccharin tablets, sanaphos, sanatogen, Savory and Moore's foods, sherry, somatose, tonagen, Torbet's lactic oats, Valentine's meat juice, valkasa, vibrona, vigoral, virol, virol and milk, vitafer, vitagen, vitalia meat juice, zomogen tonic food.

Always a Drug.

Class B1 would contain those substances and preparations which were, in the opinion of the Committee, always drugs, and could unquestionably properly be supplied to insured persons at the cost of the Chemists' Fund. It will, however, be observed that none of the substances and preparations so far referred for consideration are placed in this class.

Class B2 contains substances and preparations which are always drugs, but an insurance practitioner might reasonably be called upon to justify the prescribing of the substances and preparations in this class in the event of an investigation of his prescribing. Examples are :—

Agar-agar, Angier's emulsion, antiphlogistine, boroglyceride, californian syrup of figs, ergo apiol, Fellow's syrup, formamint tablets, glycothymoline, Heath and Heather's herbs, liver extracts, metatone.

Class B3 contains proprietary substances and preparations which are alleged to be drugs or medicines but of which the composition is undisclosed. The Committee consider that the prescribing of such substances and preparations is most undesirable, and hold that only the most exceptional circumstances could justify a practitioner in prescribing them. Examples are :—

Alkia saltrates, Andrew's liver salt, antigermis, antigermis (liquid), Beecham's pills, bisurated magnesia, Cassell's tablets, cicfa tablets, cuticura ointment, dermisol ointment, Eno's fruit salt, feen-a-mint, felsol powders, germolene ointment, Gibb's insectol cream, guycose, Hair's asthma cure, Himrod's asthma cure, intubine, irocose, kruschen salts, miol, " Odds on " liniment, pepsencia, phosferine and phosferine tablets, phyllosan, reudel bath saltrates, salvitæ, sulphaqua bath charges, tamar indien laxative lozenges, taxol tablets, Tidman's sea salt, vinculin.

Sometimes a Drug.

Class C1 and *Class C2* contain substances and preparations which may be, but are not always, drugs or medicines for the purposes of medical benefit. (*a*) *Class C1* contains substances such as cod-liver oil, extract of malt and non-proprietary preparations, and combinations of these substances. While it may be argued that such substances should technically be classified as foods, and not as drugs, yet the common acceptance and usage at the present time necessitate their being recognised as drugs in many of the cases in which they are prescribed. The Committee consider, however, that these substances and preparations are occasionally prescribed in circumstances which would render it difficult to establish that their use was therapeutic rather than alimentary. (*b*) *Class C2* contains substances and preparations, the prescribing of which by insurance practitioners is, in the opinion of the Committee, justifiable only in special circumstances. Among other substances and preparations included in Class C2 are proprietary preparations of cod-liver oil, or of malt extract, or of both combined. Examples are :—

Allen and Hanbury's malt and oil, antiseptic soaps, bemax, bynin, bynogen, byno preparations, bynol, byno and oil, bynotone, Cheltenham spa water, cod-liver oil tablets, cream of malt, cuticura soap, glovo cod-liver oil tablets, hæmatogen, hazeline cream, jecomalt, Jeyes' fluid, Kepler's maltand oil, lactagol, lactomaltine, maltine, maltine and oil, metagen, omnevit, ostelin, ostelin preparations, radio malt, radiostol, radiostoleum, resinol soap, Scott's emulsion, virolax, vitamalt, vitamine malt, vitamogen, vitmar, Wander's malt and oil, Wander's malt extract c. hæmoglobin, yeast-vite tablets.

The Committee note the possibility that information may become available at some future date which might cause them to revise their opinion of some or all of the preparations included in Class C2, but consider that for the present this classification is appropriate.

Some Special Cases.

They think it desirable to amplify their reasons for including the following substances or preparations in a particular category.

Peptonising Powders. (*Class A*).—They consider that the ordering of peptonising powders as such definitely assigns them to the position of adjuncts in the preparation, external to the body, of foods of a particular character, and consequently precludes them from being regarded as drugs or medicines for the purposes of medical benefit. They would, however, regard as drugs the components of peptonising powders, e.g., pepsin, &c., when ordered by name in definite quantities to be taken internally in prescribed doses.

Liver Extracts. (*Class B2.*)—These substances are known to exert definite therapeutic effects in certain pathogenic conditions, notably pernicious anæmia, and have therefore been included in the category of drugs or medicines. Though these effects can be obtained by the consumption of animal liver, the human digestive system may be unable to deal with the quantity of liver necessary to produce the required therapeutic effects; where this is the case, the exhibition of concentrated extracts of liver substance is essential for satisfactory treatment. The Committee consider that a standard should be fixed for these extracts.

Medicinal Herbs. (*Class B2.*)—The Committee consider that the prescribing of these crude substances rather than medicinal preparations thereof would only be justifiable in exceptional circumstances.

Antiseptic and Medicated Soaps. (*Class C2.*)—Though these substances are occasionally prescribed by practitioners of repute, the Committee have considerable hesitation in regarding them as substances which might be drugs; these soaps must be regarded as cosmetics save in exceptional circumstances.

Spa and Mineral Waters.—The Committee have experienced some difficulty in the classification of these substances, as they vary in composition from a weak saline solution suitable for the dinner table to a strong saline solution only suitable for administration as a drug. Each case must therefore be considered on its merits. Where an alleged spa water is of unknown composition, however, they would unhesitatingly place it in Class B3.

Disinfectants.—When ordered as such clearly cannot be regarded as drugs for the purposes of medical benefit, but disinfectants ordered by name in definite quantities with directions for therapeutic use internally or externally would be regarded as drugs.

Suggested Regulation.

The Committee conclude that it would be undesirable to attempt to regulate the present position by amendment to the existing regulations, and therefore recommend that a new regulation shall be made in the general form of the following draft.

1. An Insurance Committee shall have power to recover from a practitioner by deduction from his remuneration or otherwise the cost of any substance or article prescribed by the practitioner on the official form which is not a drug or medicine, or an appliance included in the Second Schedule to the principal Regulations, and shall pay the amount so recovered into the Chemists' Fund.

2. If any question arises as to the recovery of any sums under the preceding Article, or if any question arises in the course of an investigation, or otherwise, for determination whether a substance or preparation is one which should be ordered for or supplied to an insured person, the Committee shall refer the matter to the Panel Committee. If the Panel Committee and the Committee disagree, the matter shall be submitted to Referees appointed under this Article for decision in such summary manner as, subject to any rules made by the Minister in that behalf, may be directed by the Minister; and the decision of those Referees, given after hearing such parties and taking such evidence, if any, as they think just, shall be final.

For the purpose of giving effect to this Article the Minister shall, upon any such question arising, nominate as Referees two practitioners (who shall be selected from any panel of practitioners set up by the Minister for the purpose, or if no such panel exists, from among practitioners in actual practice) and one barrister-at-law or solicitor in actual practice.

The Referees may decide any question coming before them by a majority, but subject as aforesaid, their procedure shall be such as they may from time to time determine.

If on any question referred to the Panel Committee under this Article the Committee and the Panel Committee are agreed, the Committee shall report the matter to the Minister, and the Minister may, if he thinks fit, refer the question for decision to Referees in the manner provided in this Article, and the foregoing provisions of this Article shall apply accordingly.

The Committee hold that the Insurance Committee should take action under paragraph 1 of the suggested regulation when the substance prescribed (*a*) is included in a list, issued by the Insurance Committee to the insurance practitioner, of substances considered by the Insurance Committee never to be drugs, or (*b*) is adjudged by the Panel Committee in the course of an investigation of prescribing or otherwise not to be a drug in the circumstances in which it has been prescribed, or (*c*) is of such a nature that obviously it cannot reasonably be considered to be a drug.

Procedure.

The position relating to the prescribing of substances which the Insurance Committee had decided never to be drugs would be as follows: (1) The insurance practitioner would be surcharged the cost of the substance so prescribed, but would have a right of appeal to referees. (2) The insurance chemist would be required to dispense the prescription, and would receive payment. (3) The Insurance Committee would take action under the proposed regulation. (4) The insured person would have a right of complaint against the insurance practitioner under Article 32 of the Medical Benefit Regulations, 1928, for refusing to prescribe an alleged drug.

As regards substances which the Insurance Committee had decided to be sometimes drugs and sometimes not drugs, the prescribing of such substances should, in the first instance, be investigated by the Panel Committee under Article 42 of the Medical Benefit Regulations, 1928. If it was decided that the whole or any proportion of the substances prescribed were not drugs in the case in question, the Insurance Committee could recover the cost thereof from the practitioner concerned, the position of the chemist and the insured person being the same as in connexion with substances which the Insurance Committee had decided never to be drugs.

MEDICINE AND THE LAW.

Heavy Sentences for Criminal Abortion.

THE police authorities notoriously find it difficult to bring cases of criminal abortion to justice: when, however, the criminals are caught and convicted, judges inflict stern sentences. Recently, at the Central Criminal Court, Mr. Justice Talbot sentenced to five years' penal servitude a man of 43, described as a herbalist, who pleaded guilty to a charge of supplying noxious things to a number of women knowing they were to be used for the purpose of procuring miscarriage. Prosecuting counsel said that the accused had no medical knowledge: he had been a stoker in the Navy. His shop in Notting Hill Gate was in such an appalling state of dirt that it was a danger to the community for that reason alone. The judge observed that the prisoner's conduct was not only illegal in the highest degree but also dangerous to health. In another case a few days later Mr. Justice Avory inflicted a sentence of seven years' penal servitude at Bristol Assizes in respect of illegal operations and other illegal acts charged as having been committed at Bath, Bristol, Bridgwater, Cardiff, and London. The prisoner made the somewhat impudent defence that what he did was merely a pretence intended to satisfy the women that they were having treatment. There were allegations also of conversion of money and of indecent assault; the judge stated he had never met a case containing so many circumstances of aggravation. In the Central Criminal Court case (first mentioned above) it was suggested on the prisoner's behalf, in mitigation of sentence, that he had acted in ignorance of the law. The severity of these sentences may serve to remove such ignorance, if it exists.

OCCUPATION IN HOSPITAL.—The New York City Visiting Committee, a voluntary body, have formed a Hospital Occupation Committee which devotes itself to the promotion of occupational therapy. In the Bellevue Hospital children carve wooden rabbits in order to manipulate fractured wrist-bones which are mending; other patients work objects resembling spinning wheels which are really treadles for restoring strength to injured ankles. Wool, raffia, leather, and beads are distributed with instructions how to make pretty things of them. The members of the Occupation Committee act as voluntary helpers to the regular staff of occupational therapy officers, giving to the work such time as they can spare.

THE LANCET.

LONDON: SATURDAY, MARCH 1, 1930.

CENTRAL CLINICS FOR RHEUMATISM.

THE Red Cross Clinic for the treatment of rheumatism in London was opened early this week by the QUEEN; a little later than had been planned but yet at a singularly appropriate time, for it is in February that the constellation of cold, wet, dark, mist and northern latitude brings to a head the disability from chronic rheumatic disorders which cloud the lives of middle-aged people and especially those of the working classes. It is a story too often told to need repetition here what is the extent of this disability in terms of earning capacity, of wasted insurance funds, and of sheer human misery. The realisation of this first central clinic goes back ten years to the granting of a supplementary charter to the British Red Cross which enabled it to expand its services from the needs of war to those of peace. Five years ago, largely owing to the exertions of Dr. FORTESCUE FOX, the first international conference on industrial rheumatism was held in London, and since that time the official organisations of workers have gradually come to realise that timely expenditure on the relief of rheumatic disabilities at an early stage saves a bigger outlay later and that it would pay approved societies to run their own hostels at spas and to contribute freely to the cost of treatment of insured patients. This liberty has long existed abroad, and the Minister of Health has given leave now to our own societies to pay out of their funds a capitation rate to cover the fees of their members who attend for treatment.

It is Sir ARTHUR STANLEY'S hope, as chairman of Red Cross executive, to establish a chain of such clinics up and down the country, especially in the great industrial areas. Some thirty Red Cross clinics which continued active after the war will no doubt be included in the scheme, but it is in no way the intention of the promoters to limit the scope of these central clinics, and Mr. R. H. P. ORDE, speaking for the Central Bureau of Hospital Information, has definitely laid down the principle that advantage should be taken of existing facilities for the setting up of central clinics. In some places they should be associated with spas; in others with voluntary hospitals; in others again with municipal establishments. At present in London the Kensington and Hackney Red Cross clinics already give some rheumatic treatment, but the new clinic in Peto-place, as the report on p. 480 shows, is the first to be fully equipped with bathing accommodation. Although the clinic has no actual association with the existing spas in this country, their medical officers have coöperated generously in its inception, both by advice and demonstration, as well as in the training of personnel. The neighbouring Orthopædic Hospital in Great Portland-street has also placed its X ray installation at the disposal of the clinic, and its surgeons are prepared to undertake whatever orthopædic work may be necessary.

Although, as we have said, the Peto-place clinic is first in the field in London it is only just the first, for the Bermondsey Borough Council has decided to establish a clinic to treat chronic rheumatism and rheumatoid arthritis and has purchased a site for the purpose in the Tower Bridge-road at a cost of £11,000. Plans and estimates for building and equipment at a further cost of £94,000 have been adopted and passed by the council, whose intention it is to instal the most recent electrotherapeutic, physiotherapeutic, and hydrotherapeutic appliances. The story of this undertaking is of some interest. In the first instance the London County Council declined to advance a loan, on the ground that under the new Local Government Act the County Council itself was the proper authority to provide treatment of this kind, but after appeal to the Ministry of Health the loan has now been sanctioned. Before initiating the scheme the Borough Council ascertained from the authorities at Guy's Hospital that accommodation was not available there now, nor likely in the future, for treating chronic rheumatism on any large scale. It is stated that there are between 7000 and 8000 cases of chronic arthritis alone in the Borough of Bermondsey, most of them at present unable to obtain even palliative treatment.

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MUNICIPAL HOUSES.

OVERCROWDING in slum areas affects the health of the race as a whole, since no adequate protection against epidemic diseases can be offered while overcrowding continues. Public health schemes are seriously handicapped, and children living in slums cannot attain the best possible health and development. In practice, the problem resolves itself into one of child welfare; little is to be gained by uprooting old people from an environment in which they have spent their whole lives, but, with children, removal to better surroundings may make an enormous difference to mental as well as physical development. Overcrowding in this country is still very common, although it receives, perhaps, more serious attention here than anywhere else in the world. The municipal houses, which were to have provided accommodation for those for whom private enterprise does not cater, have, in practice, been occupied by those who could very well afford other quarters. The rents of these houses, though only 12*s.* or 14*s.* a week, are yet too high for the average labourer with a large family. Such tenants are inclined, not unnaturally, to feed their children before paying the rent, and are therefore unsatisfactory from the landlord's point of view. The unfortunate correlation between poverty and fecundity is well known, and the two establish a vicious circle which confines the labourer and his children to the slums.

Tuberculosis officers are continually faced with recurrence of disease in patients who return from sanatoriums to overcrowded areas; if it were possible for these patients to return to municipal houses, set in open spaces, their chance of continued health would be greatly increased, and the whole community would be benefited. At present the order in which applications for municipal houses are considered is as follows: married ex-Service men with families; married ex-Service men without families; ex-Service men intending marriage; married couples (not ex-Service) with families; married persons without families; persons intending marriage; others. This scheme allows no special consideration for sick persons, and the medical officer of health is not consulted when tenants are chosen. Dr. V. T. THIERENS, speaking at a meeting of the Society of Medical Officers of Health on Feb. 21st, suggested that the public health authorities of a district should take over about thirty council houses each year and use them for the accommodation of consumptives or other persons in especial need of a good environment; but the primary object of building municipal houses, after all, should be the removal of children from the slums. Dr. C. KILLICK MILLARD, speaking at the same meeting, proposed a system of rebates on rent for parents with large families. This system would entail a universal increase of 1*s.* 6*d.* per week on the normal rent, but with rents well below the economic standard this would probably be accepted readily. Families should then receive a rebate of 1*s.* 6*d.* per week for each of the first three children and of 1*s.* a week for each subsequent child. As the children left school the individual rebates would cease automatically, and be replaced after six months by a child-lodger tax of 1*s.* per head. To take an example, a couple with six children of school age would take a house of which the normal rent was 11*s.*, but which, with the initial increment, became 12*s.* 6*d.* During the time all the children were at school the rent would be 5*s.* per week; it would rise to 18*s.* 6*d.* when they had all left school, and fall to 12*s.* 6*d.* when they were all married or left home. The chief disadvantage of such a system is the danger, unless the corporation owns all the houses in the district, of all the municipal houses being occupied by tenants with large dependent families. A similar system is employed at Welwyn, but the rebate of 6*d.* per head is insufficient to make the scheme effective.

Much has been said against reconditioning of houses as a means of providing accommodation, and where this is undertaken in preference to building new houses it is probably a mistake. Dr. A. STUART HEBBLETHWAITE, medical officer of health for Sunderland, considers that reconditioning, though undesirable, is necessary, since few authorities have built sufficiently to avoid it. While the housing problem is so acute, reconditioning can be carried on at the same time as building, and to good purpose. If a five-roomed house is worth only £100 in the open market, and it can be put in order for £200, the expenditure is justified, since it will house five families at £40 per couple, and accommodation could not be obtained so cheaply in any other way. Where relatively expensive municipal houses are occupied by the labourers for whom they were intended, there is a serious danger that the tenants will economise on food to pay the rent. These are "good tenants" from the point of view of the corporation, but it is no economy to take a child from a slum if he is short of food in his new environment. Dr. C. LEONARD WILLIAMS, medical officer of health for Barking, believes that statistics showing milk bills of families before and after occupying these houses would give an indication of a fall in the standard of living.

The chaotic state of modern London might have been avoided had Sir CHRISTOPHER WREN been suffered to complete his plans for rebuilding after the Great Fire of 1666. Municipal houses, with all their disadvantages, are a step towards solution of the housing problem, but not as at present administered. The medical officer of health should share in deciding the tenancy; and, until a better system presents itself, rent rebates seem to offer the speediest means of removing our slum children to a better environment.

INFECTIVITY AND VIRULENCE.

A DISEASE may be highly virulent like imported small-pox or it may be highly infective like the common cold; it is fortunate for humanity that it is not often both. Epidemic disease has been described as a resultant rather than an entity: the result of an interaction between two opposite forces, the infecting agent and its host. Each time small-pox has reached us recently from abroad it has given rise to a set of cases of serious disease with a high mortality-rate, the factor of individual resistance has been wiped out by the virulence of the strain introduced, but it is remarkable how limited the epidemic has remained. A generation ago it was the generally accepted view, especially in relation to scarlet fever, that a mild case of a specific fever was equal in infectivity to a severe case, and when communicated to another person could give rise to severe and even fatal disease, but that the susceptibility of the population attacked was affected by temporary causes such as climate and dietary change, or by more subtle factors very hard to determine or estimate even by the skilful collection and treatment of data. Since that time we have learned means for determining human susceptibility which doubtless should in time throw light on such changes in resistance. Thanks to SCHICK and the DICKS, we can ascertain individual susceptibility to diphtheria and scarlet fever, and by means of their tests the conclusions reached by epidemiologists have been fortified in some cases, modified in others. It was the prevailing view that an outbreak of scarlet fever, largely a disease of the poor, came to an end because all those susceptible to the disease had been attacked; and in the main this has been verified by the Dick reaction. Epidemiology suggests that the relative insusceptibility of the Japanese to scarlet fever is due to a general immunity resulting from previous widespread epidemics, and the attack-rate, although still low in Japan, has shown an upward tendency during the last few years. The use of the Dick test by LAMY in Paris in 1926 led him to infer that immunity is conferred not only by an actual attack but by mere contact with the scarlet fever organism—a view long been held in regard to diphtheria.

In the last 30 years the attack-rate of scarlet fever has diminished in Western Europe, the case-mortality decreasing at the same time; but in Soviet Russia, Poland, and Roumania prevalence is increasing, while the case-mortality remains high; in Roumania it reaches nearly 200 per 1000. Moreover, in spite of all the preventive measures taken in the United States of America the prevalence of scarlet fever is increasing there. The decline in Western Europe may in fact depend not so much on our preventive measures as on the mass immunity conferred especially on children by widespread epidemics in the past and on the improvement in the living conditions of the poorer classes. In diphtheria it is generally agreed that a gradual latent immunisation is taking place; in German-speaking circles the possibility has been canvassed of the same phenomenon occurring in measles, a disease of high infectivity. As a rule, measles when inadvertently introduced into a hospital ward rapidly spreads to all the occupants who have not had a previous attack, but Prof. R. FISCHL and his colleagues in Prague have met with instances where children, who had not had measles, when exposed to infection failed to contract the disease; this he associates with the unusual number of non-eruptive and abortive cases. Prof. C. Noeggerath similarly has found that of 81 children exposed to infection in the course of seven outbreaks about two-thirds (56) escaped; he inclined to explain this on the ground of insufficiently close contact. Other German pædiatrists regard measles as liable to periodic variations of severity, but not of infectivity.

Application of the same principles to small-pox is precarious but tempting in view of the wide incidence over the country for some years past of a mild form of the disease with such dramatic interludes as that of the *Tuscania*. The mild type is evidently far less infectious than the severe type was generally held to be. It is known, for instance, that patients with an exanthem of the mild type out on them have travelled in crowded trams without giving rise to other cases in the area. Belief in the high infectivity of the severe form of small-pox is traditional; Rhazes was of the opinion that no one who was exposed escaped it. In the eighteenth century German writers estimated that five-sixths of all the dwellers in the then known world were attacked. English experience confirms this; in 1730–31, of the 1636 inhabitants of Hastings 705 suffered from small-pox, of the 931 who escaped no less than 725 had marks of a previous attack. In 1752 Lettsom remarked that most children in London contracted small-pox before reaching their seventh year. No rank of life escaped; a son of James II. of England, his daughter, Queen Mary, and his grandson, the Duke of Gloucester all died of small-pox. But it seems that the mortality of the disease in the eighteenth century was not so great as has been supposed. From German records we learn that the virulence varied much in different epidemics and in the same epidemics in different towns; the case-mortality which averaged 12–15 per cent. might be anything between 30 and 1 per cent. Mention of the last figure raises a suspicion that what we now call alastrim was present now and again in Germany; that it was present in England at this time there is considerable evidence. In Germany the differences were attributed to meteorological influence; should this now raise a smile be it remembered that no less scientific an observer than Sir Leonard Rogers holds that low humidity favours, high humidity checks, the disease. In this country where mean temperature follows absolute humidity a cold winter and spring would tend to an increase of small-pox.

Few living practitioners have had much personal experience of the infectivity of the severe form of small-pox. Those who had the opportunity of running round after outbreaks in the decade 1900–10 certainly formed the impression that small-pox was very contagious, based on such incidents as the following. In the north of England a delirious seaman escaped from a port sanitary hospital and was eventually found lying unconscious in his night shirt in a street urinal in a poor residential quarter. A simultaneous, or almost simultaneous, onset of the disease occurred in a considerable number of men and women. The narrow width of the urinal and the comparatively short time the infectious man was there before being removed negatived the possibility of any large proportion of those attacked having come into close contact with the sufferer. Here obviously the infectivity was very great, but the same does not hold for last year's experience. There are inevitable loopholes in the system of surveillance of small-pox, and at least two of the contacts who left the *Tuscania* for their homes developed the disease without their presence in the area being known to the executive health officer, who was not in a position to warn persons in the environment to adopt the safeguard of vaccination or revaccination. Yet in the absence of administrative action there was no further spread of infection. Again, in another instance three members of a family—father, mother, and grown-up daughter, all in a poor vaccinal condition—visited a woman contact from the *Tuscania* during the week-end and on the Sunday the onset of the disease occurred; but no spread to the contacts took place. In point of fact no further cases occurred in any instance from such contacts. Two views of the degree of infectivity have been held: one that it is in proportion to the extent of the rash; the other that it is in proportion to the severity of the strain. While both these conceptions are probably true in the main, the *Tuscania* incident goes to show that there must be other factors. Similar evidence is forthcoming from the United States of America where late cases of small-pox have repeatedly been discovered in contact with a relatively unprotected community and few or no secondary cases have resulted. In 1921 a severe and fatal epidemic in Kansas City began to make itself felt in November, but investigation revealed that two groups of fatal hæmorrhagic cases—five in all—had occurred in two different parts of the city, the one in April, the other in June, and apparently there was no further spread from these. That hæmorrhagic cases are usually infective is shown by the frequency of infection among those who handle the dead body. There is no explanation ready-made to fit these circumstances. It was formerly held that in certain communicable diseases the passage of the virus through susceptible individuals caused a progressive increase in its virulence and lethal power in much the same way as animal passage may be used to exalt the virulence of an organism. Experimental evidence on the point is scanty, and Gins holds that severe small-pox becomes milder when passed from body to body. And although the work of Topley and Greenwood suggests that an increase in virulence of the infective agent may sometimes occur in the course of an epidemic, the examination of cultures isolated at the height of an epidemic has not as a rule shown them to have greater virulence than those isolated at an earlier stage. We may recall the speculation of Sobernheim that the repeated passage of the small-pox virus through the bodies of a population immunised by vaccination brings about weakening of the strain. The *Tuscania* strain, derived as it was from India, might be capable of infecting one or at most two generations of persons of the Western race. Finally, German writers adduce some evidence in favour of inherited immunity against small-pox from vaccinated parents.

A MEDICAL EDITOR

News has reached us of the sudden death on Feb. 17th of Julius Schwalbe, who for more than 30 years had edited the *Deutsche medizinische Wochenschrift*, recently in collaboration with Prof. R. von den Velden and Dr. P. Wolff. The D.m.W., as it is familiarly known, now in its fifty-sixth year, was one of the few medical journals of the world to persist under the conditions of 1914–18, and we can testify to the tact and ability with which it was carried on through that troublous time. Although containing much less editorial matter than journals of similar scope in other countries, the D.m.W. throughout has borne the impress of Dr. Schwalbe's personality and genius for detail. His other undertakings were equally popular, the Outline of Special Pathology and Therapy, which first appeared in 1892, went through many editions and has been translated into several European languages; a large proportion of German practitioners use as their daily guide the Handbook of Therapeutic Technique for Medical Practice which he edited and of which for quite a while a new edition was demanded almost every second year. Dr. Schwalbe was interested in the conditions of medical practice in other countries and brought out in several editions a guide to the regulations for admission. At one time also he edited a Year Book of Practical Medicine.

Annotations.

“Ne quid nimis.”

GAS AND SUICIDE.

THE steady and very striking increase in the number of deaths from the inhalation of domestic gas has caused considerable anxiety. In 1918 the figure was 295, of which 102 were ascribed to accidents and 193 to suicide. In 1928 there were no fewer than 1359 fatalities, of which 1191 were suicidal. It is obviously possible that a certain number of the 168 supposedly accidental deaths were really suicide, as in cases of doubt the coroner's jury will always take a sympathetic view. It is clear therefore that the increase is very largely, if not entirely, one of suicide. A factor that must be taken into consideration, of course, is the number of gas consumers; in 1920 there were seven and a half million consumers, while in 1928 the number had risen to nearly nine million. Attention has been called to the subject in America as well as in this country, and we published recently a summary of the report of the American Medical Association's Committee (THE LANCET, Feb. 8th, p. 320). Following close on this appears the report of the Departmental Committee appointed by the President of the Board of Trade.[1] This Committee comes to the conclusion that the number of accidental deaths gave no cause for alarm, thus differing from the American authorities. Accidental death is due either to carbon monoxide in the unburnt gas, or else to the ordinary products of combustion or to carbon monoxide produced by incomplete combustion. To the latter group belong the deaths caused by geysers fixed without flues; to the former group belong the great majority of the deaths—e.g., those due to leaky pipes, absence of stop-pins in burners, disconnexion or defect in flexible tubing and other fittings, and the extinction of a burner by the boiling over of a kettle or saucepan. Like the American Committee, the British Committee discuss the importance of improving fittings and of instituting free periodic inspection, but point out that in many cases the defective fitting is one openly disapproved of by the gas company—e.g., the sliding gas chandelier which has caused 14 deaths during the last eight years. Often the owner persists in retaining a fitting of this sort against the advice of the company. The Committee feel that the many safety devices on the market are not adequately known to the public. The leakage of gas under a road surface is another danger to which attention has been drawn in recent years. The gas industry maintain that this risk is very appreciably reduced by modern methods of road construction and modern methods of laying mains. The Committee discuss the various suggested ways of dealing with the problem, but were unable to find any satisfactory solution. Steel mains would be less resistant to corrosion than cast iron. The production of gas containing a limited proportion of carbon monoxide is being made the subject of experiment both here and in Germany at the present time, and it seems probable that the monoxide could be removed from the gas without substantially increasing the cost. The Committee do not consider, however, that this measure is practicable at the present time, and think that the advantages of cheap gas outweigh the disadvantages of its carbon monoxide content. They therefore recommend that further experiments on the toxicity of gas as now supplied should be carried out. The Committee also see objections to the introduction of irritants and odours which might make escapes more obvious or discourage the suicide. Any irritant would be troublesome to the normal consumer and workman, and any new odour would confuse aged persons. They consider that the gas at present supplied has a sufficiently characteristic and penetrating smell.

Like the Medico-Legal Society, at their discussion on the subject a few years ago,[2] the Committee conclude that the blame for the great increase in suicides cannot be attributed to the gas supply, but is largely accounted for by a general increase in suicide and by a change in the method used. Sir Maurice Craig and Dr. Ingleby Oddie assured them that people who had made up their minds to kill themselves would do so somehow. The prevention lies rather in the realm of the early treatment of mental disorder than in the limitation of an invaluable domestic commodity. Every witness before the Committee agreed with Dr. Douglas Kerr's view, expressed at the discussion mentioned, that the publicity given in the newspapers has suggested gas to many people as an easy way out of life. This however applied equally, they thought, to other methods of committing suicide, even such an agonising one as drinking lysol. The general conclusion of the Committee is that there is no cause for alarm and that they are “unable to suggest any effective measures relating to the production and use of gas, whereby the tendency to commit suicide by gas poisoning may be checked, without imposing on the whole body of gas consumers a financial burden or other inconvenience which is not justified.” They can only recommend the encouragement of research, official records of fatalities, periodic conferences, and an insistence by law on the use of proper apparatus.

PSITTACOSIS IN ARGENTINA.

THE psittacosis epidemic, whose backwash we are now feeling in this country, seems to have been first observed at Cordoba, a town not far from the middle of Argentina, during July and August of last year. Cordoba is a centre for dealers in birds of the parrot tribe, who come there from Brazil and Paraguay, and it has a bird market where auctions take place. About the time mentioned, the doctors of Cordoba were struck by the appearance of numerous cases of a grave character which they diagnosed at first as typhoid, paratyphoid, or malignant influenza. It soon became apparent, however, that the symptoms did not really correspond with the types of any of these diseases, and Dr. Enrique Barros, assistant to the professor of morbid anatomy, discovered that there was coincidently a violent epidemic amongst the imported birds. This gave him the clue to the real diagnosis, and he has now given an account[3] of subsequent investigations into what is probably the biggest outbreak of this epizoötic disease as yet known to us. His meaning is not quite clear, but he says that there were “about 60 certain cases with more than a dozen familial or domestic epidemics and about another dozen of deaths. How many undiscovered cases and of indirect ætiological relation will there be?” Since he himself enumerates 64 it will probably be safe to assume that there were at least 100 cases with not less than 12 deaths. As the bird-dealers became unpopular in Cordoba they transferred their activities to Tucumen, the capital of North Argentina, where an epidemic started in September; but no figures of this are given. There was also an outbreak at Alta Gracia, about 31 kilometres from Cordoba, and at one or two other places along the railway line, following the arrival of the traders. There was also a small epidemic in Buenos Aires, which Barros hesitates to connect directly with those in the interior.

Clinically he describes the disease as presenting symptoms half influenzal and half typhoidal, but with distinctive characteristics. The incubation period is from 7 to 10 days, with a slow onset; the early symptoms are headache, lassitude, and fever which rises rapidly, accompanied at times by rigors and vomiting. Occasionally sore-throat of a diphtheritic type was observed. After the onset this clinical picture gets rapidly worse; there is continuous high fever with slight morning remissions, profound weakness, insomnia, usually delirium, and sometimes excitement, intense thirst, and complete anorexia. The skin is dry and the tongue is furred with red edges; constipation is common. The pulse is rapid (110), soft, and sometimes dicrotic. In some cases there is meteorism, but Barros did not see any splenic enlargement. The most constant and prominent symptoms are pulmonary; every form of pneumonia may occur from the scattered broncho-pneumonic type to massive consolidation. Very characteristic is a constant spasmodic cough without expectoration. Termination, if not by death, is by lysis followed by prolonged convalescence. There is nothing characteristic, says Barros, in the morbid anatomy. He is inclined to think that the bacillus discovered by Nocard in Paris in 1891, which he places in the salmonella group, is the cause of infection, but as he quotes the results of the investigation of but a single case, not much importance can be attached to his conclusions, which are admittedly tentative. His theory is that this organism is habitually present in the intestines of birds of the parrot tribe, and that it becomes virulent under conditions which lower resistance, thus producing the avian epidemic. Such epidemics do not arise in the habitat of the birds, but only when they are brought in large numbers into new and unfavourable conditions. The outbreak at Cordoba he attributes to cold and overcrowding. Once started, the contagion rapidly gets diffused and soon spreads to men—first to the bird-dealers and frequenters of the sale-rooms and then to purchasers. It is interesting to note that in Cordoba the cases were much rarer in women who do not attend sales. Barros does not consider the transference of the disease from man to man as proven. His account of the Cordoba outbreak seems to get us nearer to the actual origin of the disease than anything previously recorded, and the student of epidemiology would be grateful for all the evidence available about the first onset of the disease in birds and men respectively, and the conditions under which it seemed to develop —whether on the journey from the tropical forests or in the town. It is not unlikely, as he suggests, that the transfer of parrots in mid-winter to a cold inland plain entails great suffering for them and is favourable to the disease.

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[1] Deaths from Gas Poisoning. H.M. Stationery Office. 1930. Pp. 18. 6*d*.

[2] THE LANCET, 1926, ii., 1219.

[3] Rev. Asoc. Méd. Argent., Jan.–Feb., 1930.

On p. 442 Sir Thomas Horder and Dr. Gow give an account of nine cases of psittacosis, with a description of post-mortem findings in two. The four previous issues of THE LANCET have contained original communications or editorial articles on clinical and bacteriological aspects of the infection.

BARBITURIC ACID COMPOUNDS IN ANÆSTHETIC WORK.

SURGEONS who work largely with local anæsthetics are always on the look-out for improved measures by which the patient may be kept in a calm frame of mind although conscious during operation. On the continent, where this method is much more usual than here, many substances have been tried for the purpose, and among them somnifen, which is a mixture of diethyl and dipropenyl barbituric acids, has had a considerable vogue. G. DeTakats,[1] of Chicago, who is well known for his work with local anæsthetics, has lately given an account of valuable experiments which he undertook with somnifen, using the drug both intravenously and into the skin, as well as orally. He regards his attempts to produce a state of somnolence or light sleep by hypnotics of the barbituric acid series as unsuccessful. He finds the results too uncertain, and there is, of course, the objection, common to all injection methods of anæsthesia, that there is no means of recovering or lessening the dose should this prove excessive. DeTakats confirms the opinion previously expressed by others that the barbituric compounds have a protective action against poisoning with cocaine and its derivatives. In contrast with his views may be placed the experience of G. Link,[2] who has used sodium isoamyl-ethyl barbiturate in goitre surgery, and has been so pleased with the results that the drug has been given a routine place in his work. He gives morphia and atropine one hour before operation, and immediately before it an intravenous injection of grs. 5 to 20 of the barbituric acid salt in aqueous solution. The patient falls asleep during this injection, which is made slowly. Nitrous oxide and oxygen are used subsequently during operation. His experience is based on 460 cases. Vomiting after operation is slight, and the condition during operation is described as highly satisfactory, with quiet breathing and good colour, because a large amount of oxygen is admissible.

THE OSLO TUBERCULOSIS CONGRESS.

THE seventh conference of the Union Internationale contre la Tuberculose is to be held at Oslo from August 12th to 15th, under the patronage of the King and Queen of Norway. The sixth conference took place at Rome in September, 1928, when an organisation committee was appointed which has drawn up an attractive programme to include a discussion on vaccination by B C G, to be introduced by Prof. A. Calmette (Paris), one on thoracoplasty in the treatment of pulmonary disease by Prof. P. Bull (Oslo), and one on the instruction of students and practitioners in tuberculosis by Prof. W. His (Berlin). Prof. Th. Frölich, President of the Norwegian National Association, will preside at the discussions which, according to a resolution made in 1924, will be conducted in the French and English languages. Entries should be addressed to Mr. N. Heitmann, secretary-general of the organisation committee, at Cort Adelers Gate 6, Oslo, Norway, or to Dr. F. Humbert, secretary of the Union Internationale, at Avenue Velasquez 2, Paris. In connexion with the conference arrangements have been made for a series of tours and excursions embracing all the attractive features of Norway by road, rail, or steamship, half fares having been granted by the State Railways and some other touring organisations. Inquiries about official tours should be addressed to the Secretary of the Norwegian State Railways, Travel Bureau, Oslo, Norway.

HEALTH INSURANCE AND REJUVENATION.

A GERMAN who, on medical advice, had undergone a rejuvenation operation has attempted to recover the cost of it from his insurance company. The terms of his contract of insurance are not reported, but it would appear that he was insured against ill-health, not against death. He was 60 years old, and his argument was that old age manifested itself in ill-health, that the insurance company would have to pay him for those manifestations, and that therefore it was worth the company's while to bear the much lighter cost of removing the root of the evil; it was, moreover, to the public advantage that his working life should be prolonged. The insurance company replied that old age was inevitable and he was not insured against old age; symptoms of old age, said the company, were distinguishable from symptoms of illness; medical advice was not sufficient justification for the operation; he might please himself about undergoing such an operation on medical advice, but the operation ought not to be at the company's expense. The court of first instance took the company's side on the ground that the manifestations of old age were one thing and incurable sickness another. The Berlin Appeal Court has adjourned the appeal, pending the calling of expert evidence of adequate authority on the medical aspect of the case. Presumably the experts will be asked how far the rejuvenation treatment

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[1] Surg., Gyn., and Obst., February, 1930, p. 494.

[2] Anæsthesia and Analgesia, Jan.–Feb., 1930.

(which the plaintiff said had been successful) can be relied upon to furnish immunities.

Prevention is better than cure, but the insurance companies do not pay for prophylaxis without special agreement. The issue of a fire insurance policy is not accompanied by a free gift of the latest patent fire extinguisher; burglary policies are granted without an undertaking to bear the cost of making the premises burglar-proof. In life insurance a beginning has been made by offering free the benefit of periodical medical examination, but the companies base their business upon the known statistics of life and health and can take no account of prophylactic treatment unless the materials for actuarial estimates are available. There is annuity business, too, to consider. If and when the elixir vitæ is discovered, the companies will have to stipulate that the annuitant shall not take a mean advantage of them.

ADVISORY COMMITTEE ON INDUSTRIAL PULMONARY DISEASE.

THE Medical Research Council announce the appointment of a committee to advise upon the further investigation of pulmonary silicosis and of other pulmonary conditions associated with the inhalation of dusts arising from industrial processes. The members of this committee are :—

Arthur J. Hall, M.D., F.R.C.P., Professor of Medicine in the University of Sheffield and Senior Physician to the Sheffield Royal Hospital (Chairman).

A. E. Barclay, M.D., Lecturer in Radiology in the University of Cambridge.

J. C. Bridge, F.R.C.S.Edin., H.M. Senior Medical Inspector of Factories, Home Office.

S. Lyle Cummins, M.D., Professor of Tuberculosis in the University College of South Wales and Director of Research to the Welsh National Memorial Association.

E. H. Kettle, M.D., M.R.C.P., Professor of Pathology, St. Bartholomew's Hospital and College, London.

E. L. Middleton, M.D., H.M. Medical Inspector of Factories, Home Office (Secretary).

M. J. Stewart, M.B., F.R.C.P., Professor of Pathology in the University of Leeds.

Cecil Wall, D.M., F.R.C.P., Physician to the London Hospital and to the Brompton Hospital for Consumption and Diseases of the Chest.

This advisory committee will survey the present state of knowledge, will advise the Council upon new lines of inquiry that may be profitably pursued, and will assist in the supervision of such investigations as it may be decided to initiate or support. The work will be directed particularly towards obtaining, in coöperation with the Factory Department of the Home Office, more accurate knowledge of the causes and diagnosis of silicosis and of other industrial pulmonary disorders. The need for better knowledge of these subjects has been emphasised by the recent Report of the Silicosis (Medical Arrangements) Committee, whose recommendations to the Secretary of State for extended research work have been referred to the Council by the Home Office.

DOUBLE-SHIFT SCHOOLROOMS.

Mr. David L. Tweedie, member of a firm of Dundee solicitors, tells us that he has solved the problem of school accommodation by devising a time-table with two shifts, analogous to the late Lord Leverhulme's proposal for the full utilisation of industrial plant. Pupils from 5 to 12 years of age would attend for five 50-minute periods from 9 A.M. to 2.50 P.M., those 13 to 18 years of age for five similar periods from 3 P.M. to 8.40 P.M. Such an arrangement would allow for the extension of school age to 18 years without any addition to the number of schools, and without interfering with the meal hours of pupils or affecting their health. It would, Mr. Tweedie suggests, ensure time for home preparation of school subjects, and would finally remove the need for Parliament or any educational authority to do more than find the income to meet the additional annual outlay. Mr. Tweedie's idea is attractive and ingenious but it is not altogether new; in New York, for instance, such a scheme of school shifts is in working. It is conceivable that some similar arrangement might be tried to tide over temporary difficulties in this country; but Mr. Tweedie seems to ignore the question of staffing which would be an almost insuperable bar to his scheme from the educational side; while, from a health point of view, the double shift would make such schools and buildings as are at present unsuitable and insanitary still more offensive. Curricula are already overcrowded and intensive methods are apt to defeat their own ends with growing children and react badly on their health, at all events on this side of the Atlantic. Increased homework would give unequal results, for conscientious children flag under it, whereas the others are protected by natural indolence. It is doubtful, too, whether the available plant is there. Certainly in London, where a great number of schools are used for night classes, there is trouble now in finding suitable desks, seats, and furnishings for adolescents and adults, and the problem of lighting is serious. We do not think Mr. Tweedie has done more than state a case.

DIRECT VERSUS INDIRECT LIGHTING.

A RECENT Home Office pamphlet[1] gives a useful summary of the relative advantages and disadvantages from the industrial point of view of alternative methods of artificial lighting. One of the main essentials to a good system is the prevention of glare. This term is used to cover either one of the following phenomena: (1) the temporary dazzle caused by looking directly at a bright source of light such as an arc lamp, so that the worker is for the time being prevented from seeing other objects properly; (2) the effect produced by the presence of one or more bright sources of light towards the edge of the field of vision so that the rays enter the eye obliquely from them—this is prejudicial to the vision of objects in the more central part of the field even though the rays from the sources of bright light may never fall on the macular region; (3) the effect which is produced when the surface of cloth, metal, paper, or other material being worked upon is shiny or polished and reflects light directly into the eyes of the worker. The reflection of light from the glass of a glazed picture is a familiar example of the same thing. The first two forms of glare can be avoided either by the proper shading of the source of light or by fixing them at a sufficient height above the worker. The third, which is liable to be troublesome when the working material is polished, may be remedied either by the suitable adjustment of the source of light in relation to the eyes of the worker, or by employing diffused light—i.e., light reflected from a large surface such as a ceiling or wall. This indirect method of lighting has the further advantage of reducing to a minimum the shadows which are specially prejudicial to certain kinds of work—e.g., that of the compositor. On the other hand, indirect lighting is less economical than direct. In some instances it may even be that the production of shadows is an advantage. The perception of detail in certain classes of material depends on the contrast produced by miniature shadows on the surface—e.g., a uniformly coloured card with embossed design, or a self-coloured textile material in which miniature furrows lie in shadows cast by miniature ridges. On such material it was found that for comfortable working a higher illumination was required with indirect than with direct lighting. For the combination of efficiency with economy the pamphlet emphasises the importance of fitting the method of illumination to the particular purpose which it is meant to serve. For some sorts of work direct lighting under suitable precautions may be recommended, for others indirect lighting.

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[1] Lighting in Factories and Workshops. Home Office Welfare Pamphlet. No. 7. Third edition. 1930. H.M. Stationery Office. 4*d*.

AN ESSAY IN SEX DETERMINATION.

Prof. F. Unterberger, Director of the Gynæcological Section at the Königsberg Hospital of Mercy, has published in the current number of the *Deutsche medizinische Wochenschrift* (Feb. 21st, p. 304) an interesting account of a suggestive excursion into sex determination. He has found that the sprinkling of a little powdered sodium bicarbonate on the glans penis before cohabitation will vastly increase the probability of the resulting conception being a male. He was led to begin his investigation when he learned that sterile cows often became fertile after alkaline vaginal douching, and he discovered that the acidity of the vaginal secretion was unduly high in women who came to him complaining of sterility. An alkaline vaginal douche often led to conception in these women, and to his amazement always conception of a boy. Having the practitioner's dislike for vaginal douches, he then began to recommend the introduction of the sodium bicarbonate in the way indicated, whose utmost drawback has been a slight tickling sensation in consequence of the carbon dioxide evolved. The result, in a series of 53 cases in which there was a complaint either of sterility or persistent girl-bearing, was *always* a boy. In every case the vaginal acidity was high before the test. He made some attempt to check the results by animal experiment but found the technical difficulties very hard to surmount. The method is, indeed, so simple and harmless as to be tried almost without compunction on the human subject, and the Königsberg claim will no doubt lead to carefully controlled observations in this country. The success of the method would have some bearing on the mechanism of sex determination. Prof. Unterberger is himself an adherent of the view that the ripe egg-cell is indifferent, the sex of the conception being determined by its impregnation with one or other of the two types of spermatozoon containing respectively 24 and 23 chromosomes. It does not, therefore, surprise him that the exertion of some chemical influence on the spermatozoa might lead to the preponderance of the effect of one or other of these types of spermatozoon.

THE FELLOWSHIP OF THE ROYAL SOCIETY.

The fifteen candidates for Fellowship of the Royal Society recommended by the Council for election this year include the names of two medical men, Prof. W. W. C. Topley and Dr. Charles Todd, and several others whose work closely touches medicine. Prof. Topley has not only made notable contributions to pure bacteriology, but has devised and pursued methods of studying artificially produced epizoötics in experimental animals which have already advanced our knowledge of immunity, and have shown how complex are the problems involved in the study of epidemiology. Dr. Todd is attached to the Department of Experimental Pathology, Bacteriology, and Protistology of the National Institute for Medical Research, Hampstead, where he is continuing his serological work, started in Egypt, on the specificity of the hæmolytic power of blood-serums in connexion with heredity. Among the proposed Fellows whose research is directly associated with medical problems are Mr. H. W. Dudley, Ph.D., who is on the staff of the department of Biochemistry and Pharmacology at the National Institute for Medical Research, and Mr. R. Robison, who works as a biochemist at the Lister Institute. They are well known to our readers. Dr. Dudley has studied especially histamine and other chemical factors of vascular control, and it is to Mr. Robison that we owe the discovery that bone and ossifying cartilage contain an enzyme, phosphatase, which is regarded as an active agent in ossification. Lieut.-Colonel John Stephenson (I.M.S., ret.) was, from 1920 to 1929, lecturer in zoology in the University of Edinburgh. He is an authority on the fauna of British India. Mr. E. K. Rideal (son of Mr. Samuel Rideal, D.Sc.) is Owen Jones Lecturer in Physical Chemistry in the University of Cambridge, Mr. F. T. Brooks is a plant pathologist, and Mr. H. Eltringham an entomologist. The other names put forward are Mr. E. B. Bailey, of His Majesty's Geological Survey Department, Mr. A. M. Dirac, Ph. D., a mathematical physicist, Mr. C. A. Edwards, D.Sc., Professor of Metallurgy, in the University of Wales, Mr. H. S. Allen, D.Sc., Professor of Natural Philosophy in the University of St. Andrews, who has made a special study of the interpretation of the quantum, Mr. C. Inglis, Professor of Mechanism and Applied Mechanics in the University of Cambridge, Mr. Harold Jones, D.Sc., H.M. Astronomer at the Cape of Good Hope; and Mr. G. P. Thomson (son of Sir J. J. Thomson) who is Professor of Natural Philosophy in the University of Aberdeen.

FOOD OR DRUG?

Many preparations now put on the market by manufacturing chemists owe their virtue to the inclusion of food constituents such as vitamins. Social reformers and other altruists are wont to advocate the use of these preparations on a large scale for the insured population by including them in the schedule of drugs which chemists undertake to supply for their treatment. The drug fund, however, was never intended to provide food or to make good deficiencies in the diet of the worker and his family. The Insurance Act provides that "proper and sufficient medicines for the adequate treatment" of the insured patient shall be supplied at the cost of the fund; and it has not proved easy in practice to interpret this seemingly straightforward direction because although a number of preparations are certainly never drugs and others are certainly always drugs, there are a number which are drugs in some circumstances and not in others. The insurance practitioner can, however, now fall back upon the tables (reprinted on another page) drawn up by the advisory committee over which Dr. D. G. Greenfield presided. The report of what may conveniently be called the Greenfield Committee will enable the practitioner to distinguish more clearly between a drug and a food and to place certain substances about which doubt has arisen in their proper category, and it will guide panel and insurance committees in their administration of medical benefit in such a case as came recently before the London Insurance Committee when, after an inquiry by the Ministry of Health, a firm of four practitioners were penalised to the extent of £100 for lavish prescribing of such things as malt and cod-liver oil in a neighbourhood where conditions of life were hard and nutrition was bad. The referees held that the wholesale administration of cod-liver oil in insurance practice was only legitimate as an experiment, conducted under experimental conditions. It was impossible to countenance idealism at the expense of a limited public fund. In the *Saturday Review* of Feb. 15th Dr. F. G. Layton sharply criticises the principles of medical benefit thus laid down, but he omits to point out that the four doctors in question have had all the consideration which the Insurance Acts allow. Their case was examined first by a professional committee of their colleagues and then by the insurance committee with a final appeal to three independent referees. This board of referees is composed of two medical practitioners and one lawyer, in actual practice. Each time they had the opportunity of stating their position and of being represented before the referees. From the information before us it would appear that they exceeded what was considered by their compeers as reasonably necessary for the adequate treatment of their patients; they ordered on an average nearly seven prescriptions for each patient on their list, whereas the average for the kingdom is less than four; in certain cases the same drug was ordered in two forms for the same patient on the one prescription paper; and they prescribed cod-liver oil for its nutritive value, whereas it has always been held that nothing in the nature of food should be ordered at the expense of a fund intended only to provide drugs. Such prescribing is at the expense not merely of the drug fund but of neighbouring practitioners. Those who administer the Acts are agreed that insured persons should get as good treatment as do private patients, but it is doubtful whether any class of private patient could afford to pay for treatment on the scale mentioned.

THE OVARY-STIMULATING HORMONE.

FOLLOWING the report, noted in these columns a short time ago (THE LANCET, Jan. 11th, p. 94), of the isolation by E. A. Doisy and A. Butenandt independently of the œstrus-producing hormone of the ovary in a crystalline form, considerable interest has been aroused by the recent announcement in the lay press of a discovery by Dr. J. B. Collip, whose development of Banting and Best's process for obtaining insulin from the pancreas has played an important part in the therapeutic use of this substance. A preliminary paper by Dr. Collip on the Ovary-stimulating Hormone of the Placenta appears in the February issue of the *Canadian Medical Association Journal*, which has just reached us. Dr. Collip points out that abundant proof exists that the placenta contains the œstrus-producing hormone known as œstrin. Since the original work of Allen and Doisy on follicular fluid as a source of this hormone, œstrin has been demonstrated in the placenta, in the amniotic fluid, and in the urine of pregnancy. Here it is associated, as has been shown independently by Smith and Engle, and by Zondek and Aschheim, with another water-soluble hormone having properties quite distinct from œstrin. This other hormone has been thought to be derived from the anterior pituitary body, since intramuscular injection of extracts of this gland produce the same effects, that is, a rapid development of the immature ovary in the rat or mouse. The connexion between these hormones is of the utmost interest, for as a result of the stimulation of ovarian activity by extracts from anterior pituitary hormone œstrin is liberated, producing its typical effects (a hypertrophy of the genital tract and the phenomena of œstrus). Both hormones cause the same ultimate effect, but Dr. Collip points out the clear distinction between them. The anterior pituitary hormone acts indirectly by stimulating the ovary to produce œstrin, and therefore is ineffective in castrated animals; whereas œstrin acts just as effectively in a castrated female as in a normal one. This distinction, which arises from the work of Engle and Smith and Allen and Doisy, has been amply confirmed by other workers. Dr. B. P. Wiesner and Mr. J. S. Patel,[1] of the Department of Animal Breeding in the University of Edinburgh, have gone a step further. They have succeeded in preparing potent aqueous extracts of the ovary-stimulating hormone from human placentæ by extraction with sulphosalicylic acid. Dr. Wiesner visited Dr. Collip's laboratory at the McGill University in September last and "demonstrated in a single but convincing experiment the effectiveness of the sulphosalicylic acid extract of fresh human placenta in producing premature maturity in the young rat." At Wiesner's request, Dr. Collip made attempts at the concentration of the premature maturity-producing principle in the placental extract, the presence of which he has confirmed by many experiments. It soon became apparent, however, that the sulphosalicylic acid in the extract presented a formidable barrier to further concentration and purification of the active principle. Various methods of extraction and fractionation were therefore tried and the active principle has now been obtained, free from protein, salt, lipoid, and œstrin, in the form of an aqueous solution which may be administered either subcutaneously or orally. It is possible, says Dr. Collip, to place the equivalent of 100 g. of placenta in 1 c.cm. of water with a relatively small loss of the active principle contained in the original tissue. The potency of the extract can be standardised by a modification of the method of Zondek and Aschheim. In order to ensure that it is free from œstrin it must be without effect on castrated animals. Whether, as has been assumed by some workers, the ovary-stimulating hormones derived from different sources are all the same and are all derived from the anterior pituitary gland is not proven. The hormone *may* be secreted by the pituitary gland and stored in the placenta, but Dr. Collip inclines to the belief that it is actually elaborated in the placenta. This contention is supported by the fact that the placental hormone, unlike the anterior pituitary hormone, is effective by the mouth, and it appears to have other properties distinguishing its action from that of extracts of the anterior pituitary gland. The point is at present mainly of theoretical interest. The concentration and purification from the placenta of the active principle by means of fractionation processes (to be described later) have been brought by Dr. Collip to a point where one rat unit may be represented by 0·01 mg. of dry substance. Certain micro-crystalline fractions of great potency have been obtained, but it is impossible to state as yet whether such fractions are pure chemicals. The dosage by mouth may be not more than two or three times the effective subcutaneous dose. Injection of the active extract into adult castrates is without effect. The laboratory results reported in Dr. Collip's preliminary communication are based on assay studies of 150 immature rats, and have seemed to justify experimental clinical study. In the same issue of the *Canadian Medical Association Journal* Dr. A. D. Campbell and Dr. Collip publish a preliminary report on the clinical use of the substance. "Definite results of a most encouraging character" have already been obtained in five cases of scanty menstruation, in two cases manifesting distressing menopausal symptoms, and in two cases of dysmenorrhœa. It is hoped with good grounds that further studies may throw new light, not only on problems of ovarian dysfunction and hyperthyroidism, but also on some of the toxæmias of pregnancy.

RECONSTRUCTION OF SUNDERLAND INFIRMARY.—The reconstruction of this hospital is about to be advanced a step farther by the provision of a new administration block at a cost of £36,000. The present block is totally inadequate, and its replacement has become urgent; it will be demolished when the new building is ready. The work forms part of a comprehensive scheme estimated to cost £150,000, which began with the construction of the Princess Mary wing of 95 beds. A similar block has yet to be erected, but meanwhile there has been an addition to the plan in the shape of a pathological department, now under construction.

LONDON IRISH MEDICAL GOLFING SOCIETY.—A successful dinner and dance was held at the May Fair Hotel on Feb. 20th, Mr. Hugh Lett presiding. Over 300 members and guests were present, amongst the latter being Mr. Arthur Greenwood, M.P., Mr. V. Alexander, M.P., and Sir Robert Stanton Woods. The speakers included Lord Russell of Killowen, Lord Moynihan, Mr. Hugh Lett, and Mr. M. J. Smyth. The menu was skilfully devised to suit the occasion, containing such items as pommes au roi d'argent and salade greensome, and the company showed every sign of enjoying the fare provided.

THE END OF A FLOATING HOSPITAL.—Some 35 years ago a floating hospital was erected at Jarrow for the detection and treatment of foreign-borne diseases, and during the war patients from all vessels of the navy entering the Tyne were treated there. During the last 10 years the hospital has been little used, and since repairs would be costly the Ministry of Health and the Tyne Port Sanitary Authority have agreed that it shall be sold and broken up. In future patients who would have been received within it will be sent to the Walker Gate Hospital.

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[1] Nature, 1929, cxxiii., 449.

FIG. I. (Case 3).

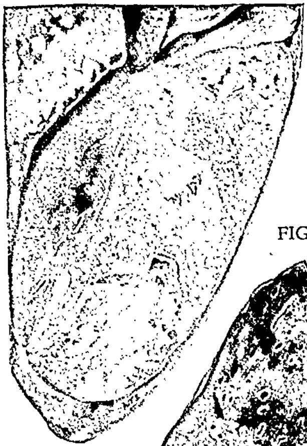


FIG. II. (Case 9).

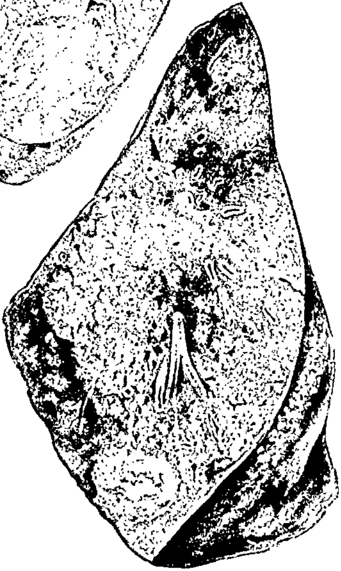


FIG. III. (Case 3).

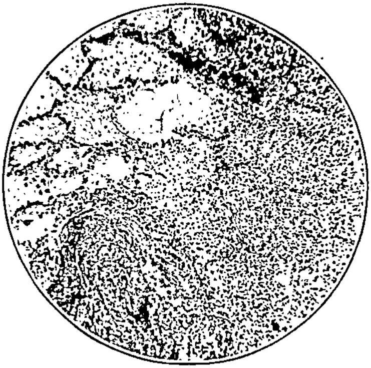


FIG. IV. (Case 3).

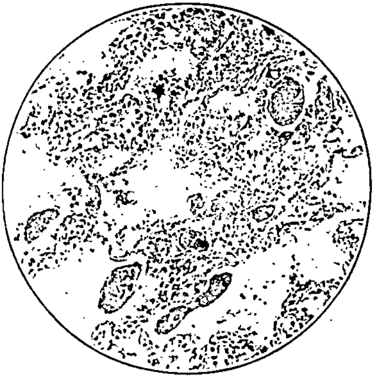


FIG. V. (Case 9).

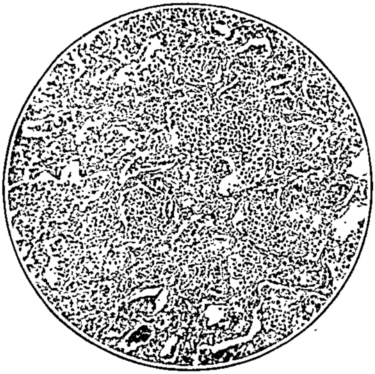
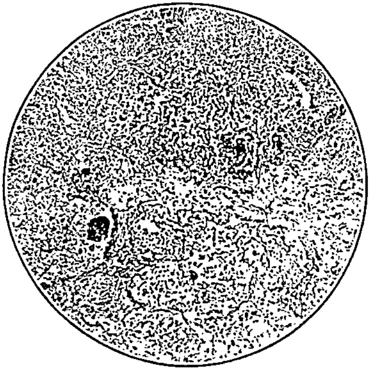
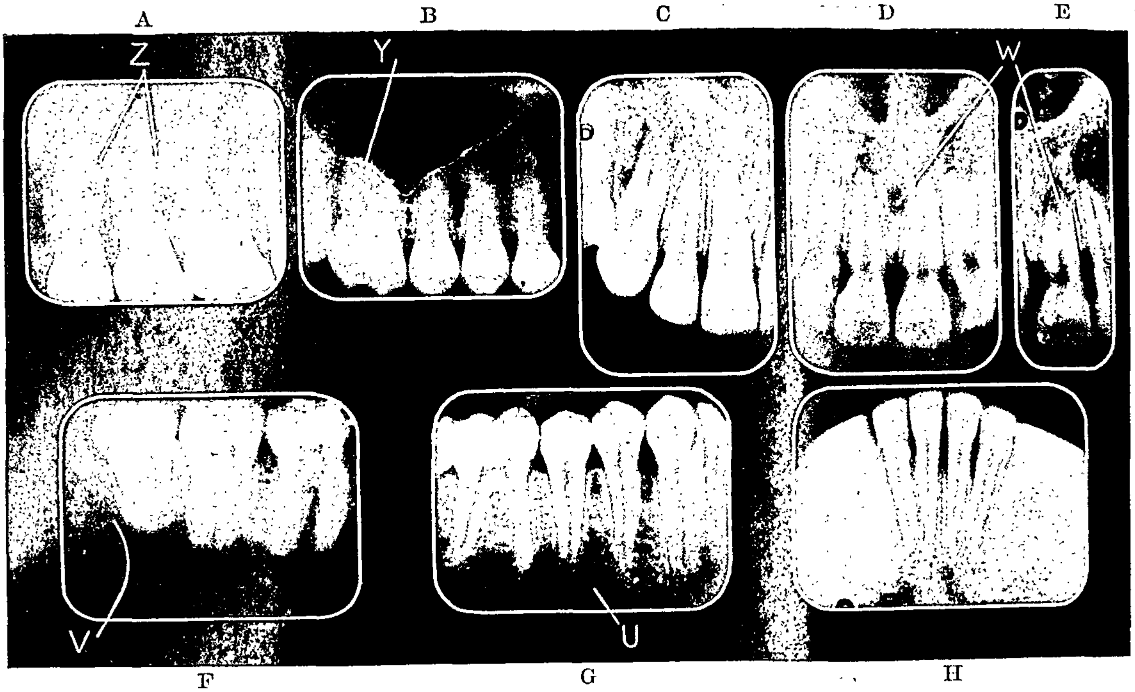


FIG. VI. (Case 9).

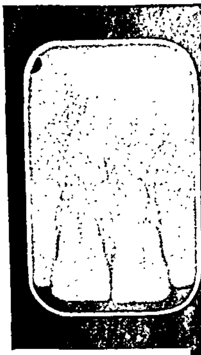


SIR THOMAS HORDER AND DR. GOW: PSITTACOSIS.

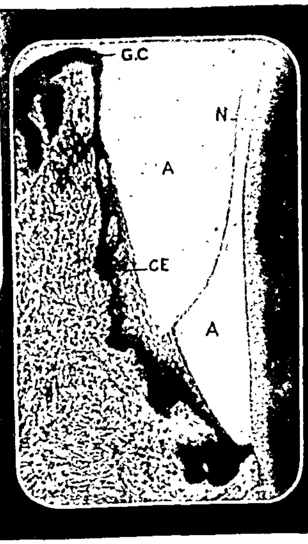
FIG. I.



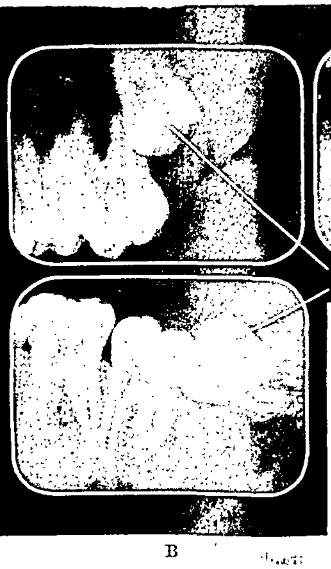
II.



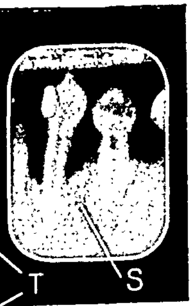
III. c



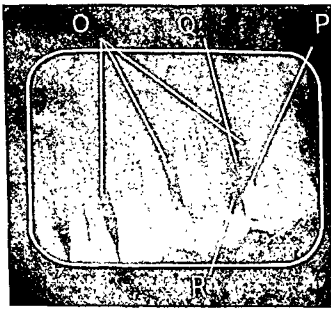
IV. A



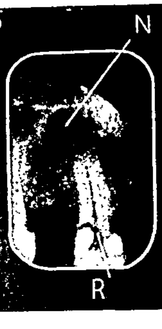
V.



VI.

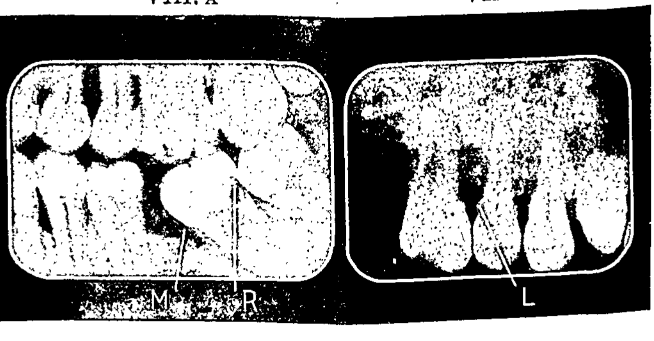


VII.



VIII. A

VIII. B



MR. C. BOWDLER HENRY: INTERPRETATION OF DENTAL RADIOGRAMS.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LXIV.—THE INTERPRETATION OF DENTAL RADIOGRAMS.

PART I.*

General Observations.

AT the outset it should be appreciated that a radiogram is but one link only in the diagnostic chain, and though it be a very important one, its value is directly proportional to its proper usage as one component of a whole. To condemn or to exonerate questionable teeth upon their radiographic appearances alone is to do so upon insufficient, and sometimes faulty, evidence.

When it is at all feasible, radiographic findings should be correlated with the results of a clinical dental examination. Dental surgeons and their patients sometimes suffer when a doctor, after a cursory inspection of dental films, expresses an opinion, often founded on an incorrect interpretation, contrary to the considered advice of the dentist. It is highly desirable, therefore, that the doctor should be versed in the interpretation of dental radiograms, so that he can correlate them with the clinical reports and decide on appropriate action. Though dental sepsis may not be sufficiently potent in a particular case to cause a secondary lesion, it is capable, even in mild degrees, of swinging the balance, and it may also put an effective drag on recuperation. Dental radiograms should therefore be taken in all cases of debility or chronic ill-health.

The practice of radiographing suspicious teeth and ignoring edentulous spaces is unwise; to take the patient's word that he is edentulous is often to miss a hidden source of focal infection. At the Mayo Foundation all patients are submitted to a dental examination, which includes a full set of films, as a matter of routine.

Examination of Dental Films.

It is not sufficient to hold dental films casually to the light and note only the gross changes, such as impacted teeth, the outline of cysts, or the presence of obvious apical rarefaction. The films should be examined first generally by the naked eye and then critically with a lens over a suitably diffused source of light, such as an opal glass electric lamp

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* Part II. will appear next week.

DESCRIPTIONS OF ILLUSTRATIONS ON SPECIAL PLATE.

MR. C. BOWDLER HENRY: INTERPRETATION OF DENTAL RADIOGRAMS.

The illustrations show one-half of a fairly normal set of dental films, some examples of errors of interpretation which may arise through taking radiograms from an incorrect angle, and some teeth with caries and periodontal disease. Some of the teeth have had fillings, shown as radiopaque (white) clearly defined areas.

FIG. I.—(A) Malar process often casts a radiopaque shadow (Z) over the apices of the upper molars.

(B) The antrum, delineated by an even line (Y), is in close proximity to the premolar and molar roots. In order to display the antrum this film was taken from an angle which makes the premolars appear foreshortened.

(C) Shows the first premolar, canine, and lateral incisor, from left to right of film.

(D) Shows anterior palatine fossa (W) in correct position between the apices of the central incisors. The nasal fossæ are in close relation to the apices of the central incisors.

(E) Shows same fossa (W) superimposed upon the apex of the right central incisor, and might be mistaken for area of rarefaction. This film, of which the left half only is reproduced, was taken to show the lateral incisor. The angulation, therefore, was incorrect for the central incisors. This shows the need for taking enough exposures to obtain correct angulation.

(F) Inferior dental canal (V) shown below apices of molar teeth.

(G) Mental foramen shown as a dark patch (U) between and below apices of first and second premolars.

(H) Lower incisors.

FIG. II.—Foreshortening of the image of the upper central incisors (the same teeth as shown in Fig. I., D) due to using too high an angle. Foreshortening and absorption with regeneration of bone are easily confused, and confirmatory radiograms are desirable in all cases where foreshortening occurs.

FIG. III., C.—Photomicrograph of the amelo-gingival junction in a young dog. Nasmyth's membrane can be seen sagging towards the tooth, the subjacent enamel having been dissolved away. The epithelial barrier formed by the junction of the membrane and epithelium of the gingival trough is the first defence to be broken by the ingress of pyorrhœa. A = Space created by the solution of the enamel. N = Nasmyth's membrane (enamel cuticle); the membrane collapsed towards the dentine on account of loss of support when the enamel was dissolved. G.C. = Gingival crest. C.E. = Crevicular epithelium. D. = Dentine.

FIG. IV.—Upper and lower third molars (T) in a boy aged 17. Owing to lack of developments antero-posteriorly in the jaws these molars are unable to erupt into normal position. The inclination of each presents the commonest variation. The lower is locked with the second molar and has prevented it from erupting normally. This boy's only sister (older), his mother, and his mother's brother had similarly impacted third molars.

FIG. V.—The mental foramen (S) is subject to variation of position and may appear in close apposition to the apex of the second premolar simulating a pathological area of rarefaction.

The first premolar in this film exhibits an advanced stage of local periodontal disease aggravated by traumatic occlusion with the teeth of the opposing jaw. Note the loss of alveolus and the open funnel-shaped socket produced by the marginal rarefaction.

FIG. VI.—Caries (R) in distal aspect of second molar shown as a black patch. Ragged edge (P) to faulty filling has encouraged food stagnation with production of a deep pyorrhœa pocket (Q). Advanced periodontal disease between molars in a patient of good resistance, who has put up a sclerotic barrier in the cancellous tissue of the septum (O).

FIG. VII.—Caries (R) below a filling shown as a dark radiolucent halo. Death and putrefaction of the pulp has led to chronic apical infection (N).

FIG. VIII., A.—Shows evil following extraction of first permanent molar, viz.:—

(1) Occlusion with the opposing upper molars is thrown out of gear. Therefore loss of natural function and cleansing.

(2) Food impaction between the molars has produced caries (R) and an incipient pocket.

(3) Food stagnation under the tilting side of the crown has produced a deep pyorrhœa pocket (M). Ultimately the tooth will be lost.

FIG. VIII., B.—Periodontal disease produced or aggravated by subgingival tartar (L) seen as projections on the side of the roots with well-defined pockets below.

SIR THOMAS HORDER AND DR. GOW: PSITTACOSIS.

FIG. I. (Case 3).—Part of lower lobe of left lung. The general lung tissue is of a greyish colour due to a somewhat solid form of œdema. There are patches of pneumonic consolidation, chiefly subpleural in distribution, into which hæmorrhage has occurred freely. (Drawing made by Mr. W. Thornton Shiells after specimen had been prepared for Museum.)

FIG. II. (Case 9).—Lower lobe of left lung. At the base the pleura is covered with a fine exudate through which small subserous hæmorrhages are visible. On the cut surface near the middle of the lower border is a firm grey asbestos-like patch of consolidation surrounded by an area of hyperæmia. The lung in the centre of the lobe is œdematous and brownish-grey in colour. Beneath the pleura, to the left, the lung shows a patch of almost confluent consolidation, red in colour. The bronchi show no gross change. (Drawing made by Mr. Shiells immediately after autopsy.)

FIG. III. (Case 3).—Thrombosed vessel with neighbouring area of consolidation, and on the left œdema.

FIG. IV. (Case 3).—An area near a region of necrosis, showing the coagula in the alveoli.

FIG. V. (Case 9).—Consolidated area. Two structures at the periphery, somewhat resembling coagula in Case 3.

FIG. VI. (Case 9).—Margin of a necrosed area.

or preferably a proper viewing box. The films should be the best procurable. Even when the definition of the radiogram is very fine, imagination must play a large part in visualising the morbid anatomy of the parts seen, and therefore mediocre radiograms are misleading. Only the central portions, where the rays have penetrated the tissues and impinged upon the film with correct incidence, should be used, and the outer portion of a film where the image may be distorted should be discounted. A sufficient number of exposures should be made to make this possible. Twelve of the stock size dental films is, in my opinion, the minimum, supplemented when occasion arises by two more and by stereoscopic films of uncertain areas. The doctor should make it his duty to learn, by watching dental films being taken, the relative positions of tube, tissue, and film for the various groups of teeth in the average mouth.

Examples of the importance of taking several views are illustrated in Fig. I., E, where the shadow of the anterior palatine fossa has been transposed behind the apex of the lateral incisor, giving rise to the appearance of an apical rarefaction; and in Fig. II., where by using too acute an angle of incidence the radiologist has produced an appearance of foreshortening which resembles a type of absorption of the roots of the teeth occurring in one manifestation of dental sepsis. The desideratum is that the shadow of a tooth projected on to the film should appear identical in length with the tooth, but, as the dental film cannot be placed in an ideal radiological position, the factors of human judgment and error cannot be entirely eliminated. Some radiologists tend to foreshorten the images of certain teeth, whilst others tend rather to elongate them.

With the films upon a viewing box in a suitably darkened room a general inspection should be made first to note general characteristics not merely of the teeth themselves, but particularly of the periodontal membranes and of the cancellous tissue of the jaws in this region.

FIG. III., A.

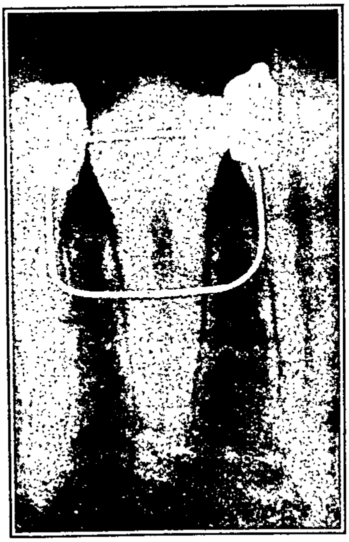
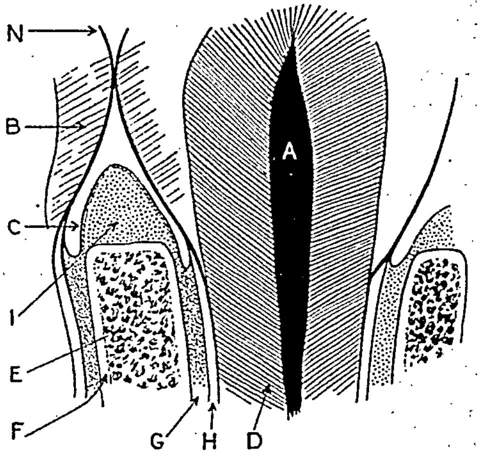


FIG. III., B.



III., A.—Enlarged radiogram of one of the normal premolars shown in Fig. I. A diagram of the framed portion is shown in Fig. III., B.

III., B.—A = Pulp. N = Nasmyth's membrane, epithelial layer covering enamel (B) and reflected on to gum at the termination of the enamel in the gingival trough. C = Gingival trough lined by epithelium (see Fig. III., C). D = Dentine. I = Interdental papilla not visible in X ray, greatly filling space between the teeth. E = Cancellous bone of interdental septum. F = Lamina dura which appears as white line in X ray and is continuous over top of septum to the next socket. G = Periodontal membrane which appears as black line in X ray. It has strong fibrous bands which sling the tooth in the socket. H = Cementum which secures the ends of the fibrous bundles to the dentine.

A General Survey.

In the general preliminary survey the following points should be noted:—

1. The arrangement of the teeth in relation to the normal position (see Fig. I.). In the normal young adult with a well-developed arch the teeth are arranged vertically in perfect order, the crowns of adjacent ones in contact but not overlapping, and the roots on all of them tapering to finely pointed apices. In length the roots are approximately twice the height of the crowns. When the premaxillary region is underdeveloped (due probably to early adenoids), the arch of the teeth is pinched in this region and malposition and overlapping of the incisor teeth in varying degrees result. Underdevelopment posteriorly causes shortening of the jaws in an antero-posterior direction, when the third molars (or wisdom teeth) of both jaws are unable to erupt easily in a vertical direction and may even remain buried. They are subject to considerable variation of position. Fig. IV. shows one of the typical misplacements, the importance of which is discussed below.

2. The presence of other unerupted teeth, supernumerary teeth, and foreign bodies, and the tilt or evidence of undue stress in teeth adjacent to edentulous spaces or supporting artificial dentures.

3. The character of the osseous framework generally and any gross changes in this tissue such as sclerosis or rarefication.

4. The position of those normal structures both radiolucent and radiopaque, which act as landmarks. Normal structures may be mistaken for pathological conditions, or may be encroached upon by morbid conditions occurring around the roots of the teeth.

Structures in the Maxillæ.

The delineation of the *antrum* (Fig. I., B) by a thin layer of hard bone surrounding a radiolucent area above the molar and premolar teeth should be observed. This sinus extends sometimes as far forward as the lateral incisor, and is often mistaken for an area of pathological destruction especially when septa dividing it into loculi are present. Conversely, a small dental cyst invading the antrum may easily be mistaken for a loculus of that sinus. Stereoscopic plates and a comparison of the two sides are helpful in avoiding such errors. A large dental cyst displacing the floor of the antrum upward and filling the entire space formerly occupied by that cavity may also be unrecognised, but with this the physical signs are more apparent.

The *malar process* (Fig. I., A) often casts a radiopaque shadow over the apices of the last upper molar teeth, preventing clear definition. It should not be mistaken for an area of pathological sclerosis.

The tip of the *coronoid process* sometimes appears on an upper molar film.

In the front of the mouth the *median suture*, the *anterior palatine canal, foramen and fossa* (Fig. I., D) may be mistaken for periapical destruction above one or other of the central incisors, especially when the tooth is known to be pulpless.

The *nasal septum* often throws a radiopaque shadow across the roots of the upper incisors, and the *nasal fossæ* are sometimes observed in close relationship to the apical extremities of the central incisors (Fig. I., D).

The *canine fossa* over the lateral incisor and the canine varies greatly in depth, and radiograms of this region show corresponding variation in radiolucence.

Structures in the Mandible.

The *inferior dental canal* is seen extending forward below the roots of the molars and premolars in Fig. I., F. Disease of these teeth is a frequent source of chronic trouble in this branch of the trigeminal nerve, which may persist indefinitely after the teeth themselves have been removed. It will be noticed that the canal is closer to the third molar than the other teeth, a fact which is of importance in surgical procedures connected with this tooth. Impacted third molars are found not uncommonly grooved, where they were in contact with the nerve.

The *mental foramen* (Fig. I., O) is seen as a radiolucent area between the apices of the first and second premolars. Sometimes it is hardly to be distinguished, but at other times it may appear so closely applied to the root of a premolar as to simulate a morbid condition of this tooth and forms a common pitfall in diagnosis (Fig. V.). If the radiogram is of proper texture determination may be greatly aided by tracing the inferior dental canal to the foramen and by radiograms taken from different angles, coupled with the electric test for vitality of the tooth concerned.

In the region of the lower molar roots and roughly parallel to the mandibular canal, but above it, is a radiopaque band. It is a shadow thrown partly by the *mylohyoid line*, which is lingual to the molar roots, and partly by the dense bone of the *external oblique line*, which passes to the outer side. In strongly built subjects this shadow is sufficiently opaque to obscure the detail of the roots of the last two molar teeth.

Having reviewed these anatomical variations before proceeding to the critical examination, it is wise to look at the radiograms as a whole, noting any change common to them all, such as increased or decreased definition of the roots, increased or decreased thickness of the trabeculæ of the cancellous bone, general loss of the alveolar edges, the presence of any unusual degree of apical rarefaction, or of sclerosis.

Detailed Inspection.

After a general inspection radiograms of the teeth should be examined seriatim with a lens, the observer paying attention to the structures described below and shown in Fig. III., A and B.

1. *The crown.*—The enamel is clearly defined as a cap of denser material covering the exposed portion of the tooth, being thickest in the cusps on the masticating surface and thinning to its termination at the neck of the tooth, where it ends in a delicately chamfered edge (Fig. III., A and B) having no projecting ledge or sudden break. Fillings and artificial crowns should be made to imitate this smooth continuity of surface from root to crown as closely as possible, otherwise stagnation of food occurs at this rough place with injury and infection of the subjacent periodontal membrane, and ultimate caries in the root deep to the filling (Fig. VI.).

Caries beneath a filling may be seen as a radiolucent (dark) area extending even down to the pulp, and is a source of neuralgia and later of infection and death of the pulp (Fig. VII.). The position of the crown relative to its neighbours should also be noted. A slight breach at the point of contact, leading to food impaction, or undue tilting of the crown, interfering with proper cleansing, gives rise to caries (Fig. VIII., A) and to periodontal infection. For the same reason the presence of subgingival tartar should not be overlooked (Fig. VIII., B).

2. *The pulp chamber and canals.*—These should have a regular, clear outline. Secondary dentine—as an inward bulge upon the pulp boundary—or pulp nodules may give rise to neuralgia from a tooth externally normal and clinically alive. This deposition of dentine within the pulp and the much rarer destruction of dentine proceeding from the pulp outward are the only affections of the pulp which are portrayed in a radiogram. It is not possible to distinguish whether a pulp is dead or alive. When the pulp has been extirpated and the root filled with radiopaque material, such as gutta-percha, the apparent mechanical success of the operation should be observed; but a well-filled root does not necessarily mean a sterile, healthy root, for the dentinal tubules may be full of septic material. It is one stage better, however, than a poorly filled pulp chamber or than a pulpless tooth with no root filling at all.

3. The *root of the tooth, the periodontal membrane*, and the *lamina dura* of the socket should be examined together. The *surface of the root* should appear smooth and should pursue a regular course toward the apex. There should be no excrescences or excavations upon it and the apex should be moderately pointed, unless bending of the root toward or away from the rays hides it. As the dentine is denser than the bone, the shadow cast by the root obscures that of the superimposed and subjacent cancellous tissue, except occasionally toward the end of finely tapered roots, where the cancellous network may even interfere slightly with the shadow of the root apex. The *periodontal membrane*, interposed between the tooth and the wall of the socket, appears as a fine, black radiolucent) line, clearly defined and of even thickness, except at the apex of the root, and of almost the same tenuity as a hair. The *lamina dura* of the socket is seen as a thin white (radiopaque) line of compact bone covering the cancellous tissue of the alveolar processes. There should be no breach in its continuity.

4. The *crests* of the interdental septa are formed by the junction of the laminæ duræ of the adjacent sockets where they join that covering the cancellous tissue of the septum. Between the incisor teeth, where the interproximal spaces are narrow, the septal crest appears as a thin, elongated spine of hard bone formed by the convergence of the laminæ duræ of the two socket walls (Fig. I., C). Toward the back of the mouth, owing to the greater convexity of the crowns of the teeth, the interproximal spaces become broader, and here the lamina dura passes straight across from the margin of one socket to that of the next (Fig. I., G).

5. The *cancellous tissue* of the bone between and around the teeth. Its recognition is largely a consideration of the thickness of the trabeculæ, the spaces which they enclose, and their general arrangement. In the maxillæ the pattern is that of a fine, irregular small meshed honeycomb; while in the mandible the trabeculæ form large irregular spaces with a general tendency downward and forward in the premolar and molar region.[1] No definition, however, of normal appearing cancellous tissue can be given and in apparent health it is subject to considerable variation.

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INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 15TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 322 (last week 374); scarlet fever, 2680; diphtheria, 1896; enteric fever, 41; pneumonia, 1330; puerperal fever, 45; puerperal pyrexia, 118; cerebro-spinal fever, 13; acute poliomyelitis, 13; encephalitis lethargica, 15; dysentery, 6; ophthalmia neonatorum, 111. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Feb. 18th-19th was as follows:—Small-pox, 563 under treatment, 30 under observation (last week 571 and 26 respectively); scarlet fever, 2247; diphtheria, 2821; enteric fever, 17; measles, 1048; whooping-cough, 93; puerperal fever, 29 (plus 17 babies); encephalitis lethargica, 121; "other diseases," 14. At St. Margaret's Hospital there were 13 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was 1 death from small-pox (assigned to Enfield U.D.), none from enteric fever, 79 (29) from measles, 12 (4) from scarlet fever, 31 (2) from whooping-cough, 55 (17) from diphtheria, 38 (15) from diarrhœa and enteritis under two years, and 80 (14) from influenza. The figures in parentheses are those for London itself.

Fatal cases of measles were concentrated at Portsmouth 13, Manchester 12, West Ham 5. Deaths from whooping-cough at Liverpool 7, Bradford 4. Diphtheria claimed 6 victims at Liverpool, 4 at Birmingham, and 3 each at Tottenham and Salford. Eight deaths from influenza were reported from Birmingham, 5 from Liverpool, 4 each from Salford, South Shields, and Newcastle-on-Tyne.

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[1] Colyer, J. F., Dental Surgery and Pathology, fifth edition, 1923, chap. xxxvii.

The number of stillbirths notified during the week was 263 (corresponding to a rate of 39 per 1000 births), including 54 in London.

Fatal Case of Small-pox.

The fatal case of small-pox which occurred in the urban district of Enfield, was that of an unvaccinated male, aged 70 years, taken ill on Jan. 27th, when the rash first appeared. There was no preliminary complaint of any kind, and the rash was profuse, pustular, and confluent. Dr. D. H. Geffen, medical officer of health, was called in on Jan. 30th, when a diagnosis of small-pox was made. The patient died on Feb. 6th.

Special Articles.

OPENING OF THE CENTRAL CLINIC FOR TREATMENT OF RHEUMATISM,

PETO-PLACE, MARYLEBONE.

ON Tuesday last the new central clinic for the treatment of rheumatism, built and equipped by the British Red Cross Society at Peto-place, Marylebone-road, London, N.W. 1, was opened by H.M. the Queen. The prevalence of rheumatic diseases in this country is so great that the Ministry of Health attributes nearly one-sixth of industrial invalidity to them. These cases cost nearly £2,000,000 yearly in sick benefit, and over 3,000,000 weeks of lost work. During the last four or five years the approved societies and the medical profession together, realising the waste of time and money caused by rheumatic disease, and the lack of facilities for adequate treatment, have sent delegations to continental centres to study the work done there. The organisation of these continental clinics is usually excellent, and arrangements are made for the treatment of labouring men and women after work hours. The results are good and often lead to a resumption of work which had become impossible. It was clear that a series of such clinics could do much to diminish the rheumatic disabilities in this country, and the British Committee on Rheumatism proposed to the British Red Cross Society that an appeal should be made for funds to equip the first clinic of the series. An appeal for £40,000 was accordingly made, and the sum was rapidly subscribed, their Majesties the King and Queen heading the list. When two-thirds had been collected Sir Otto Beit guaranteed the remainder; the approved, friendly, and benefit societies, and members of the Stock Exchange and various banks also contributed. The Prudential Assurance Society gave all the linen and towels.

The Building.

In considering the site, a central position easily accessible by omnibus and train was desired; the disused Baptist Chapel between Park-square East and Peto-place fulfilled these conditions, and was also spacious and soundly built. On the plans of Mr. T. A. Pole it was converted into a modern clinic equipped with every recent form of apparatus for the treatment of rheumatism. The costs of construction and equipment have been covered by the interest on the appeal fund, and the capital remains intact. The clinic will have a definite scale of charges depending on the income of the patient. The third floor is reserved for the treatment of well-to-do patients, whose fees will help to support the rest of the clinic. The lower floors will be used for patients who cannot afford high fees, but whose doctors have recommended them for treatment. Members of approved societies will be charged on a special scale, 3*s.* for a single treatment and 25*s.* for a course of not less than eight treatments. Other patients will be charged whatever fee is thought suitable by the lady almoner when she has assessed their incomes.

Staff and Arrangements.

The staff of the clinic includes 11 honorary consulting physicians, five honorary visiting physicians—Dr. M. B. Ray, Dr. F. D. Howitt, Dr. C. B. Heald, Dr. B. S. Nissé and Dr. W. S. C. Copeman—a medical superintendent, Dr. A. R. Neligan, and a sister-in-charge and lady almoner. The actual treatment is to be conducted by a skeleton staff of masseuses and nurses at present until the extent of the work becomes stabilised There is accommodation for between 300 and 400 patients a day, but a larger staff will, of course, be necessary before so many come under treatment. It is estimated that each masseuse can treat 15 patients a day, on an average, provided that at some points she can have two patients under treatment at the same time; to take an example, one patient can be massaged while another patient in the same room is being treated with radiant heat. The clinic will be run entirely for out-patients and treatment will be given by appointment, so that no patient need be kept waiting. On three nights of the week the clinic will remain open until 9 P.M. to give men and women of the labouring classes an opportunity to come for treatment when their work is done; men and women are to be treated on alternate days.

Ground Floor Accommodation.

The accommodation for treatment is spacious and attractively arranged. Upon entering, well-to-do patients go at once to the third floor by lift, while others pass through the admission office and thence to the lady almoner. They are next interviewed and examined by the physician, and treatment is prescribed; after making an appointment they leave and return at the required time. If they are to receive bath treatment they pass to a series of cubicles supplied with seats and mirrors, where they undress and put on a specially designed bathing dress which leaves the back and limbs uncovered. They pass without waiting to another series of cubicles containing showers and foot baths, and then straight on into the room where they receive treatment. This is fitted with whirlpool, douche, and needle baths, and with Vichy, Aix, and Buxton installations. These rooms are arranged round a circular central court which plumbs the whole depth of the building and is lighted by a glass dome above. In the centre of this court is an immersion pool about six or seven yards in diameter, divided by three partitions so that each portion can be used for a different treatment if necessary. The compartments are fitted with steps and teak seats on which the patient sits while receiving manipulative treatment under water, or while performing exercises in voluntary movement. Undercurrent douches can be given through special pipes. On this floor there is also a hot air room and a vapour bath. After treatment the patient receives a hot bath sheet and lies down on a couch in the rest room before returning to his cubicle to dress.

Upper Floors.

On the second floor is the main consulting room, with an adjoining examination room fitted with cubicles and a couch, staff rooms, the secretary's office, and the office of the sister-in-charge. These also are arranged round the central court, along a corridor which leads also to the treatment and massage rooms. Each of the treatment rooms is equipped with its full complement of electrical, radiant heat, ultra-violet light, and diathermy apparatus, so that any treatment prescribed can be administered in any given room by a single masseuse, and there is no occasion for the patient to pass from room to room or into different hands. Two such rooms completely equipped are at present ready for use, with curtained cubicles at hand in which the patient can undress.

After treatment the patient passes to a cooling-off room and rests before dressing. There is also equipment on this floor for treatment by Plombière lavage, which is installed in a separate room. The third floor, which is devoted to the better class of patient, is supplied with all the same apparatus as the other two floors. Besides treatment rooms it has its own immersion bath, whirlpool, undercurrent douche, and needle baths, and includes a lounge where patients can wait if necessary. There are also vapour and hot air rooms, and accommodation for an X ray apparatus should it become desirable to instal one. It has been decided to use softened Thames water rather than imported or artificially prepared waters, in the belief that heat and immersion are largely responsible for results rather than the composition of the water.

The conditions to be treated are as follows. Chronic rheumatic diseases, such as chronic articular arthritis, spondylitis, and gouty arthritis; also lumbago, muscular rheumatism, sciatica, and fibrositis, muscular weakness due to paralysis, neuritis, neuralgia, and the sequelæ of injury to or inflammation of joints, muscles, tendons, bones, and nerves—a wide programme. It is hoped to make the clinic a centre for research, and a laboratory is at the disposal of the staff. Treatment will begin by about the middle of the month.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Hospitals and Sweepstakes.

LAST week the Dail gave a second reading to a Bill, introduced by Sir James Craig, designed to legalise the holding of sweepstakes and lotteries for the support of hospitals and sanatoriums in the Irish Free State. Sir James made it clear that he was not enamoured of this method of raising money, but he had been forced to believe that unless funds could be raised in the near future some of the hospitals might have to close their doors, and he knew of no other means by which the need could be met. He gave detailed information on the financial position of certain Dublin hospitals. The measure was left to the free vote of the House, and only six deputies were found to vote against it. Among these was President Cosgrave, who, sympathising with the difficulties of the hospitals, pointed out that the measure, if passed, would constitute a precedent on which those interested in other charitable projects could build a case for other exceptions to the Lottery Acts. The proposal has received a certain amount of opposition outside the Dail. In particular, the Archbishop of Dublin, in a sermon on gambling preached last Sunday, deplored the measure, and the facilities given to it by the Dail. His condemnation was based on moral grounds, but he added the pertinent observation that one inevitable reaction would be that those hospitals which resorted to questionable methods of finance would cease to awaken the same sympathy in the breasts of voluntary subscribers as they had done in the past.

Complimentary Dinner to Dr. W. W. Murphy.

Dr. W. W. Murphy, of Coolgreany, Co. Wexford, has been honorary secretary of the County Wexford Medical Practitioners' Association for some thirty years. During that time his energy and common sense, his tact and courtesy, succeeded in keeping the profession of the county a singularly united and harmonious body. The high respect in which he was held in the county gave him an added influence in his dealings on behalf of the profession with the various local authorities. It was fitting, therefore, that his fellow practitioners should, on the occasion of his resignation of the office of honorary secretary, show their gratitude and friendship for him in some definite way. They therefore entertained him to dinner at Bennett's Hotel, Enniscorthy, last week, and presented him with a handsome clock as a token of esteem. Dr. G. E. J. Greene, of Ferns, presided over a company of more than half the medical men in the county, and apologies for absence were received from all those whom distance or other causes prevented from attending. Dr. W. C. Lawler, in a speech in honour of Dr. Murphy, said that if he were asked by a young man starting his medical career for a bit of grandfatherly advice, he would say: "Show consideration, respect, and loyalty to your fellow medical men." Whatever of that advice he himself practised he owed to the inspiration and example of Dr. Murphy. Medical men outside County Wexford are glad to note the compliment paid to Dr. Murphy by his immediate neighbours. He has been an active member of the several Irish medical organisations, and is held in respect and friendship by all who know him.

Dublin Slums.

It is disconcerting to learn that, in spite of the amount of building in Dublin and its neighbourhood in the last ten years, the problem of the Dublin slums is greater than ever. Speaking at the annual meeting of the Incorporated Orthopædic Hospital last week, Dr. M. J. Russell, medical officer of health for the city of Dublin, said that there were more unsanitary rooms and dwellings in Dublin to-day than at any time in its history. There were kitchens occupied at present that had been closed in his predecessor's time.

Condition of Poor-law Institutions in County Clare.

A recent report by one of the medical inspectors of the department of Local Government and Public Health, Dr. A. D. Clinch discloses a shocking condition of several of the institutions under the charge of the Board of Health for County Clare. Of the Ennistymon District Hospital, containing 22 patients, he says: "This building is hardly fit for habitation. It is without any inside sanitary conveniences, and is a danger both to patients and staff. It should be closed until a new hospital is provided." Of the County Nursery, with 61 patients, he says: "All the buildings are in a very bad state of repair; the roofs are leaking; the laundry is of the worst type; there are no baths, no inside sanitary accommodation, no disinfecting apparatus, and the staff are working under great difficulties." The County Home, containing 412 infirm patients, has no inside water-closet in the body of the house, and "the necessity for the complete reconstruction of the home is very urgent." When the report containing these statements was read to the board no action was taken.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Edinburgh Orthopædic Clinic.

AT the new Settlement in the Pleasance, one of the most overcrowded areas of East Edinburgh, the executive committees of the Pleasance Trust and the Chartered Society of Massage and Medical Gymnastics have established an orthopædic clinic. The whole settlement has as its superintendent the Very Rev. J. H. Miller, D.D., ex-Moderator of the United Free Church. Dr. Miller's social work is one of the great things in Scotland. Nothing is foreign to him, and he has done everything to bring about the association of the settlement with child welfare work and orthopædic work, including all that is connoted by "remedial gymnastics." At the opening, Miss Gertrude Herzfeld, Surgeon at the Sick Children's Hospital, explained that the work at this clinic had been inaugurated by members of the Chartered Society of Massage and Gymnastics because they felt that there was too big a gap between the work at the hospitals, which was given entirely free, and the work done by the private masseuse, for which the ordinary fees were necessarily high. The masseuses had decided to start a clinic for people of limited means who wished to pay but could not afford the full fees, and by the kindness of the Pleasance Trust they had been allowed to start it in the Pleasance. The clinic was meant to be self-supporting. Patients were as a rule recommended to come by their own doctors, and the work was done under medical supervision.

Housing Improvements in Edinburgh.

The new housing improvements proposed for Edinburgh involve the provision of 1557 houses for displaced tenants, and the scheme is the largest of its kind ever undertaken by the Corporation. The total cost would be about £854,000, which amounts to about a penny per pound on the rates. The reports of the medical officer of health, the burgh engineer, and the sanitary inspector furnish abundant justification for the Corporation's action in framing the proposals. The general death-rate per 1000 for the area is 19, as against 14·3 for the whole city. The pulmonary tuberculosis death-rate is 1·3, as against 0·9 for the city. The death-rate for other forms of tuberculosis is 0·7 for the area, as against 0·3 for the city, and the respiratory diseases death-rate is 4·2 for the area, as against 2·2 for the city. The infantile mortality is 120, as against 84 for the city. Under five deaths were 36·2 per cent. of total deaths, against 17·1 for the city. These facts are reinforced by the details of overcrowding. The sanitary inspector quoted cases of common stairs which included from 29 in one case to 49 "houses" in another, and provided accommodation for from 107 to 119 people. That, he said, made decent and healthy living impossible. The stairs were of the spiral variety, and were so dark as to be dangerous.

The area chosen contains some of the oldest houses in Edinburgh. It was on passing some of these that Edmund Parkes said that these were not houses but villages standing on end. Those ancient and ill-constructed tenements are the supreme difficulty of the great Scottish cities. In the new schemes the Corporation intends to take care that the general historical landmarks shall not be too seriously interfered with. This area of St. Leonards has been crying for improvement for two or three generations. The success of the other Edinburgh housing schemes has, no doubt, had an influence in inducing the Corporation to make this great further effort.

The Blind of Dundee.

The Dundee and Lochee Mission for the Outdoor Blind are peculiarly fortunate in receiving under the will of the late Sir James Duncan, of Coupar Grange, Perthshire, a sum amounting to £59,901. Within the last ten or twelve years the whole problem of the blind has been placed on a much more satisfactory footing. One does not know the conditions of this large bequest, but it seems a pity that the money could not be controlled by some central body in the interests of the Scottish blind as a whole, or even of the Dundee blind as a whole. The problems of work and teaching have given a great deal of trouble to the authorities, but those problems are working towards a satisfactory solution. Under the Statute, the Health Department for Scotland is guided by a large Advisory Committee, which includes general and technical members. No doubt the developments in Dundee will be supervised in such a way as to ensure that this relatively large sum shall be equitably administered.

Glasgow Corporation Lectures.

Prof. John R. Currie, of Glasgow University, in a recent lecture on Infection and Progress, gave some striking instances of how disease disappears not from direct attack but incidentally as a result of social movements. He referred to two forms of infection as of special importance. The two principal ways in which infection spreads were, he said, by spray from the mouth in the act of speaking or coughing, and by blood-sucking insects. Medical and social progress had consistently warred on the process of infection, but one result of each movement for the betterment of the people was that certain diseases had been extinguished in this country long before medicine had discovered their causes or found specific methods of control.

The return by Dr. Pratt Yule, the county medical officer of Fife, states that 335 cases of tuberculosis were notified in the county during 1929, that 315 were confirmed, that the number of known cases on Dec. 31st was 911, and that the number of cases in institutions was 97.

At the annual meeting of the Edinburgh Juvenile Organisations Committee Lord Linlithgow commended strongly the work of the association, and put emphasis on the need for careful case-recording. This organisation acts as a clearing-house for the societies affiliated with it. But it also does direct work. It keeps close touch with the police-courts and with the sheriff court.

Correspondence.

"Audi alteram partem."

THE MECHANISM OF PULMONARY COLLAPSE.

To the Editor of THE LANCET.

SIR,—Why do not open wounds of the visceral pleura involve collapse of the lung? In your leading article last week on Surgical Access to the Chest reference is made to recent discussions involving answers to this question, as well as to Sir John Rose Bradford's valuable address on Massive Collapse of the Lung. May I explain what appears to me to be the solution of this and many other problems arising out of various clinical phenomena?

It is over thirty years ago that I first directed attention to the clinical importance of the physiological rhythmical dilatation and contraction of the bronchioles.[1] In utero the lungs of the full-time child are solid and the trachea and bronchi are collapsed, or any potential space is occupied by secretion. At birth the dilatation of the nostrils and glottis aid free inspiration and this air soon occupies the trachea and larger bronchi. The contraction of the glottis on expiration impedes the escaping breath, hence the air is in part retained, only to be increased in volume at the next breath. This rhythmical dilatation and contraction of the nostrils and glottis is associated with corresponding rhythmical dilatation and contraction of the bronchioles, which get quickly filled and overfilled and thus the alveoli too become filled with air.

The same physiological rhythmical dilatations and contractions of the bronchioles ensure the continued full dilatation of the pulmonary vesicles against the contractile force exercised by the elastic fibres in the lung, and thus, too, under normal conditions the air pressure and oxygen tension in the vesicles is maintained. Consequently, a shell wound ripping open the chest wall and its parietal pleura is not followed by collapse of the lung, provided the visceral pleura remains intact. Hence, too, the surgeon operating for empyema need not fear to open the chest wall and parietal pleura even in the absence of adhesions between the pleural layers, provided the visceral pleura is uninjured.

On the other hand, a minute perforation (very much smaller that the glottis) of the visceral pleura results in acute pneumothorax, the lung collapses unless, of course, adventitious adhesions suffice to prevent this otherwise inevitable sequence. Once collapsed, the minute perforation of the visceral pleura usually soon heals and closes, and then again the physiological rhythmical dilatation and contraction of the bronchioles will make that lung dilate up and reoccupy the normal space belonging to it in the chest. This but repeats what caused that lung to dilate at birth and become a normally distended lung.

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[1] Encyclopædia Medica, 1st ed., vol. ii., 1899, p. 117, and Bristol Medico-Chirurgical Journal, March, 1903, on the Probable Rhythmical Contraction of the Bronchial Muscular Coat as a Factor in Pulmonary Disease.

If my theory is correct this rhythmical dilatation and contraction of the bronchioles explains why it is that sometimes distension of the pulmonary alveoli occurs beyond the site of obstruction by a close-fitting foreign body like a bean in a bronchus. Inspiratory dilatation allows the air to pass into the bronchus past the bean, but on expiratory contraction the bronchiolar muscle clings so tightly to the surface of the bean that no air escapes, or at any rate less than was inspired into that pulmonary area.

I am, Sir, yours faithfully,
PATRICK WATSON-WILLIAMS.

Clifton, Bristol, Feb. 24th, 1930.

"A PERNICIOUS TYPE OF ANÆMIA."

To the Editor of THE LANCET.

SIR,—Dr. Avery's report on a pernicious type of anæmia following erythræmia, appearing in your issue of Feb. 15th (p. 342), presents points of great hæmatological interest. Is it not, however, time that the term "pernicious type of anæmia" be discarded? It is, I think, commonly agreed that the essential hæmatological characteristics of pernicious anæmia are: reduction in the number of red corpuscles, with a high colour-index; leucopenia; and relative lymphocytosis, together with an invariable megalocytosis. In Dr. Avery's case the leucocytes were never below 8000 per c.mm., and at this time the lymphocytes were 6·67 per cent. Then again, as Addison was the first to point out, emaciation does not occur in pernicious anæmia, whereas Dr. Avery's post-mortem report states that the body was wasted. The indefinite character of the ferro-cyanide reaction in the spleen is certainly an unusual finding in the typical disease. It seems that the only reason for regarding the anæmia as being of pernicious type is the fact that the patient improved when given half a pound of liver daily.

I find untenable Dr. Avery's explanation of anæmia due to excessive irradiation as being the result of destruction of erythropoietic tissue and impairment of the hæmolytic function of the spleen. Mayneord and Piney (*Brit. Jour. Rad.*, 1928) showed an extreme degree of hæmosiderosis in the spleen of rabbits that had been exposed to large doses of X rays. Furthermore, in cases of chronic myeloid leukæmia with severe secondary anæmia irradiation of the bones only is often followed by reduction in the number of leucocytes and a rise in the number of red corpuscles.

May I in conclusion express my gratification that there still remain writers who, in spite of the modern fashion, will publish accounts of singular cases of such great interest as the one under discussion.

I am, Sir, yours faithfully,
A. PINEY.

The Cancer Hospital, Fulham-road, S.W., Feb. 21st, 1930.

REST IN THE TREATMENT OF GONORRHŒA.

To the Editor of THE LANCET.

SIR,—Dr. Byles's insistence on the importance of rest in bed in gonorrhœa cannot be too strongly emphasised. Surely, however, the time has hardly yet come when "the onus of refusing to lie up must be put on the unhappy victim." "Propaganda and leaflets" may, as Dr. Byles says, have "made these complaints a subject of ordinary conversation in mixed companies," but in the previous sentence he admits the "still persisting taboo, disgrace, and secrecy" involved. There are few walks of life in which the required rest in bed can always be carried out without disclosing the real nature of the illness, sooner or later. The routine treatment of gonorrhœa in the Army V.D. hospitals wisely includes compulsory rest in bed during the acute stage of the disease, and this is of psychological as well as physical importance in bringing home to a man the necessity of taking the disease seriously.

May I also briefly refer to Dr. Sequeira's letter of Jan. 18th on compulsory treatment of V.D. and the rejection by Parliament of various Bills thereon? In approving its action, he dwells entirely on the debatable ground of the relative curative value of salvarsan, but surely the case for compulsory treatment rests as much on the fact that salvarsan therapy is the quickest and most efficacious method of rendering a patient non-infective to others as on the permanency of the cure of the individual.

I am, Sir, yours faithfully,
W. H. DICKINSON PRIEST,
Late M.O. i/c Venereal Diseases,
British Army of the Rhine.

Royal Waterloo Hospital, Feb. 24th, 1930.

HOUSING AND RHEUMATIC DISEASE.

To the Editor of THE LANCET.

SIR,—Environment is certainly an important factor in producing the rheumatic diseases, including rheumatoid arthritis, which are responsible for a large amount of invalidity in this country. R. H. Miller has indeed remarked that environment, taken as a whole, is of such importance that rheumatism may be regarded as an environmental disease. Of these environmental conditions housing occupies the first place, and a survey of housing since the end of the great war throws much light on this subject. The shortage of houses at the end of the war necessitated rapid erection. Wooden houses at first took the place of more permanent structures, and this was followed by the adaptation of army huts. Then came jerry-built houses of cheap brick with walls of minimum thickness, ready made staircases, doors and window-frames of unseasoned wood. Foundations were laid with inefficient ventilation, no tongue and grooved boarding was used for flooring; in low lying districts houses were built on marshy soils without efficient draining. One can picture what must be the condition of clothing, bedding, and furniture in such houses, and how the sweating plaster, the ground gases passing between the floor boards, the timber warping and leaving spaces for the admission of damp must affect the health of the inhabitants.

These new houses are, I believe, a definite cause of rheumatism and fibrositis. Rheumatism may be induced in an individual living in one district, whereas in another district not many miles away he may be quite free from pain and inconvenience. There are, for instance, two places in the Thames valley within easy reach of London less than a mile apart but separated by the river. In one of these districts rheumatism is almost unknown, while in the other it is extremely prevalent. The former is flat with gravel soil and a limited number of trees. It is on the level of the river. The latter abounds with trees, has a heavy loam and gravel soil, and is 40 feet higher than the river. They have the same water-supply, and the climate is identical. A man well known to me removed from the former to the latter, and within a few weeks could only roll out of bed in the mornings. Six months later he moved back again on account of the rheumatism which had become so severe. Within two days he could rise in the mornings without discomfort, and except for a few fibrous nodules the rheumatism disappeared. In another district 250 miles from London rheumatism is very prevalent. This district is flat with the subsoil water only a few inches below the surface; there are few trees and the town is bleak and windswept. It is surrounded by miles of flat marshy land and is at sea-level. At one point where numerous dwellings abound the subsoil water is 4 inches from the surface; ground gases are most prevalent. The soil is sandy and the water-supply is derived from artesian wells, the water being very hard. The climate is mild and the sea breezes are gentle and often of a sultry humid character.

Facts such as these have led me to believe that the production of rheumatic disease is largely determined by living in houses with damp subsoil and damp rooms, and, by exposure to cold and wet climatic conditions.

I am, Sir, yours faithfully,
FRANK RADCLIFFE.
Harley-street, W., Feb. 23rd, 1930.

A DERMATITIS FROM FACE POWDER.

To the Editor of THE LANCET.

SIR,—Recently a spinster, aged 41, consulted me regarding an inflammatory condition on both cheeks. It was practically restricted to the malar area. She stated that the trouble had appeared four times during the last three months. Heat, burning, redness, and much discomfort followed on each occasion she had applied a rouge powder to tint this part of her face. The same powder had been used by her occasionally, in exactly the same manner, for a number of years without the least inconvenience. Upon examination, besides the very evident inflammatory zone on the cheeks, the flush areas, forehead, chin, and nose, showed well-marked early stage of rosacea. This condition, the patient thought, had only appeared recently. The face powder was kindly examined for me by Mr. T. H. Byrom, F.I.C. It contains carmine, chalk, but is chiefly made up of angular transparent particles and a few spicular bodies. The two last are certainly silicates. The diagnosis was: numerous traumata upon a developing rosacea.

It would interest me to know if others of your readers have come across this distressing dermatosis. This patient had seen her own medical man two or three times for this complaint, without getting any relief. A lip salve containing eosin has been mentioned by Audry and Valdigue as having occasioned objectionable injuries; but I do not remember having seen reported acute eruptions caused by face powders. If they do occur, are they usually associated with the angio-neurotic changes which take place on the face of some women in middle life?

I am, Sir, yours faithfully,
Wigan, Feb. 20th, 1930. R. PROSSER WHITE.

THE CASE AGAINST THE WIDAL TEST.

To the Editor of THE LANCET.

SIR,—In your editorial article of Feb. 1st on the Case against the Widal Test you mention that while "O" antigen gives rise to "O" agglutinin "H" antigen gives rise to both "O" and "H." This statement is surely at variance with modern opinion, which generally maintains that there are two classes of antigen "each stimulating *in vivo* its own antibody with which it exclusively reacts."[1] The confusion has apparently arisen in the use of the letter "H" which, first applied to a certain (*Hauch*) type of growth, was subsequently used to denote the particular antigen, "H" giving rise to the floccular agglutinin. It is also stated that "in inoculated persons the anamnestic reaction is accompanied by 'H' not by 'O' agglutinins." This statement apparently rests on Felix's assumption that the blood of inoculated persons (in any condition other than enteric infections) does not contain "O" agglutinin in greater titre than 1 in 100, and consequently anything over this titre is an absolute indication of an enteric infection. Felix's assumptions have been recently discussed and criticised by Gardner,[2] who points out that such a "threshold" titre is purely empirical and depends to a considerable extent on the technique employed by Felix.

The fallacies of the ordinary quantitative Widal are so notorious in the tropics, where inoculation is largely used, that special interest has been taken here in the qualitative receptor analysis of Felix, and for the past year in these laboratories both methods have been followed in parallel (an alcoholic bacterial emulsion being used for the "O" antigen). The results so far obtained have been in complete agreement with those of Gardner, the "O" agglutinin in healthy inoculated individuals and in inoculated persons suffering from some non-enteric condition (malaria, kala-azar) rarely exceeding a titre of 1 in 200. On the other hand, in an inoculated person suffering from true enteric (*B. typhosus* isolated from the fæces) the serum taken on the tenth day showed the following "O" titres: T 50, A 0, B 50 ("H" agglutinins were absent). Owing to the distance of the patient from Khartoum further estimations were impossible.

In my experience titres of "O" agglutinin of more than 1 in 125 in any enteric case appear to be rare for the first 10 or 12 days of the fever, and as it is impossible in many cases in natives to ascertain whether they have received previous TAB. inoculations or not, the qualitative method has so far proved (in many cases) to be just as inconclusive as the ordinary quantitative method, and while giving valuable assistance cannot supplant the standard method.

I am, Sir, yours faithfully,
E. S. HORGAN,
Assistant Bacteriologist, Sudan Government.
Khartoum, Feb. 15th, 1930.

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[1] Bruce White: System of Bacteriology (Med. Research Council), "The Salmonella Group," 1929, iv., 101.

[2] Gardner: Jour. Hyg., 1929 xxviii, 376.

PSITTACOSIS.

To the Editor of THE LANCET.

SIR,—Further investigations with the organism which I recovered from the blood of our patient A. B. (one of the Warwick cases of this disease, described in my previous letter)[1] would point to its being nearest to *B. fæcalis alk.* It is certainly not a salmonella. The patient herself is now quite convalescent. On Feb. 12th—that is, six days after the temperature had returned to normal—I put up her serum against the typhoid group, salmonella, and her own bacillus. Whereas I got entirely negative results with the first two, her own bacillus was very definitely agglutinated down to dilutions of 1 in 125.

I am, Sir, yours faithfully,
A. T. W. FORRESTER,
Medical Superintendent,
Feb. 25th, 1930. Warwick County Mental Hospital.

VOLUNTARY HOSPITAL NURSING HOMES.

A PRACTICAL PROPOSAL.

To the Editor of THE LANCET.

SIR,—The voluntary hospitals of London provide over 12,500 general ward beds and 1250 pay-beds for the patients of London day by day throughout the year, and the public response to meet the cost of reconstruction and modernisation since the war has been so great and so generous that I venture to make a practical proposal with regard to the endowment side of hospital work which could be effected without appeal to the public. It is a simple business proposal, and it is suggested in the reference made by H.R.H. The Prince of Wales at the last annual meeting of the King's Fund to the subject of pay-beds.

The proposal is for the existing paying patients' beds to be increased from 1250 beds to 2500 beds, with the status of "Voluntary Hospital Nursing Homes," for the admission, not only of those of small income who are able to pay a contribution towards the cost of maintenance, but also for those of better means whose present resource, in case of serious illness, is a private nursing home at charges ranging from 8 to 12 guineas a week, with extras. By a simple calculation it can be shown that with an inclusive charge ranging from 4 to 10 guineas, an average of 7 guineas a week or possibly less, the surplus income beyond the actual cost of maintenance would (subject to the capital arrangements referred to later) be sufficient to pay off the capital expenditure in about three years. The proposal needs the assistance of the Unemployment Grants Committee—a Government committee appointed to make grants for work that will give employment to unemployed men from the mining districts—without which the period of redemption would be longer.

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[1] THE LANCET, Feb. 8th, 1930, p. 323.

Let me give an example, an actual instance of a hospital with 100 general ward beds which needs 25 beds for paying patients—a capital outlay of £25,000. The usual contribution by the Unemployment Grants' Committee would be £15,000 and the contribution by the hospital, by means of a loan, a sum of £10,000. The surplus income from the pay-beds, with an average charge of 7 guineas a week, would amount to a sum of £3500 a year—i.e., sufficient to pay off the hospital loan of £10,000 in about three years. The hospital will have become possessed of 25 beds for paying patients, the surplus income of which, when the loan has been repaid, will be sufficient to pay the cost of maintenance of 25 beds in the general wards of the hospital.

The proposal could be carried out on an average charge of less than 7 guineas a week, but the period of redemption of capital would be proportionately longer. I believe, however, that whatever charge is found most workable, the suggestion is one which would be welcomed by a very large section of society, especially those interested in hospital work, who would be likely to prefer to send their family to the nursing home attached to the voluntary hospital in which they are interested. The charge would be less than they would pay in a private nursing home, and there would be the added inducement that they would be contributing towards the permanent endowment of a general ward bed in the hospital in which they are interested.

The general result would be that within the next year or two the paying patients' beds throughout London could be increased from 1250 beds to 2500 beds, and three or four years later, when the capital charges have been paid off, the surplus income from the beds would then be available permanently to provide the entire cost of maintenance of 2500 general ward beds for the wage-earning class—without cost to the hospital and without appeal to the public.

I am, Sir, yours faithfully,
A. BRUMWELL THOMAS.

F.3, Albany, Piccadilly, W., Feb. 22nd, 1930.

WE regret to record that Mr. ARCHIBALD R. FEE, Ph.D., died on Feb. 23rd. He was a keen and devoted investigator in experimental physiology, on which he was working at University College, London, with the aid of a Beit Memorial Fellowship for Medical Research. Though only 24 years of age at the time of his death, he had already made considerable contributions to the physiology of the kidney, and some of these papers will appear posthumously. His ambition and determination was to qualify in medicine, and he had already begun some preliminary studies directed to that end. Dr. Fee's home was in British Columbia, which he left with a University degree before he was 20 years of age.

A LEWES HOSPITAL FUND.—Inaugurated in the Sussex county town six years ago by the then Mayor, Alderman W. Canadine, a hospital penny fund, covering the borough of Lewes, and a number of parishes around, had a record year in 1929 when £925 was collected. Of this sum £815 was paid to the Lewes Hospital, and £66 to Brighton hospitals. There are nearly 5000 subscribers to the fund.

Obituary.

ALFRED HERBERT TUBBY, C.B., C.M.G., M.S., M.B. LOND., F.R.C.S. ENG.,

CONSULTING SURGEON TO THE WESTMINSTER HOSPITAL.

WE regret to announce the death of Mr. A. H. Tubby, consulting surgeon to the Westminster Hospital and for many years a well-known authority on orthopædic surgery and the surgical diseases of childhood. Mr. Tubby died on Sunday last, Feb. 23rd, in a nursing home, at the age of 67. He had but recently retired from active practice.

Alfred Herbert Tubby was born in 1862, the son of Alfred Tubby and his wife, who was a Miss Frances Roe. He received his education at Christ's Hospital, and entered as a medical student at Guy's Hospital, where he immediately started a distinguished scholastic career, as he obtained prizes at his own medical school and also the gold medal in medicine in the examination for the London degree of M.B. and the gold medal in surgery in that for the B.S. degree. He proceeded to the M.S. in London and in 1887 obtained the F.R.C.S. Eng. He early showed his bias towards orthopædics by appointments at the Evelina Hospital for Children and the Royal National Orthopædic Hospital in 1892, and when two years later he was elected assistant surgeon to the Westminster Hospital, this branch of surgery remained his particular subject of interest.

MR. TUBBY.

[*Photograph by Elliott & Fry.*

He pursued studies at different intervals as occasion offered at Halle and Leipzig, and as a result he published in 1906 the first version of his well-known text-book on Surgical Deformities. This work was a departure in English and confirmed his position as an orthopædic surgeon, but the later version entitled "Deformities including the Diseases of the Bones and Joints," which appeared in 1912, was largely a new book. For during the intervening 16 years the progress of orthopædic surgery had been very large and varied, and so much rewriting was found necessary that the work may be regarded as a new one. The opportunity of rearranging the subjects was also fully taken so as to group together conditions which are allied ætiologically and pathologically, while assistance to the reader was provided through profuse illustration by plates and figures, many of them being original. For this book the author received great credit, and it is noticeable that in the many arguable points both in causation and treatment which a vast subject entailed upon him, Tubby, while giving full value to personal opinions derived from great experience, was fair in his judgments. The lavish employment of pictures undoubtedly increased the utility of a valuable text-book.

On the outbreak of the European war Tubby was attached as consulting surgeon with the rank of Colonel A.M.S. to the British Mediterranean Expeditionary Force, and from 1915 to the end of the war served with the Egyptian Expeditionary Force, being mentioned three times in despatches and receiving the honours of C.M.G. in 1916 and C.B. in 1918. His story of the Gallipoli Campaign appeared in 1921, and gave a graphic picture of the sufferings of the troops and the sanitary difficulties which had to be surmounted or endured.

While Tubby's name is chiefly associated with his orthopædic work, he was a good general surgeon, and in that capacity, though having the particular care of his specialty, he acted as surgeon, and later consulting surgeon, to the Westminster Hospital for no less than 36 years, for 30 of them as full surgeon in charge of beds. His association with the Evelina Hospital was even longer, and at the Orthopædic Hospital he worked for a generation, and he thus acquired a particular interest in, and knowledge of, the diseases of childhood, which took expression in the foundation, with the late Mr. Sydney Stephenson, of a society for their study, which is now represented by a Section in the Royal Society of Medicine, over which in 1912 Tubby presided. He was president of the same section at the meetings of the British Medical Association on two occasions—namely, in 1907 and in 1921. He was recognised outside his own country as a pædiatrician, being a member of several French scientific societies and also of the American Orthopædic Association. Although mainly known as an author of one great text-book on his own specialty, he collaborated with Sir Robert Jones in a book on the surgery of paralysis and, as President of the Hunterian Society, he delivered the Society's annual oration upon similar lines. He was a frequent contributor to our own columns, when his clinical papers were always marked by clearness and accuracy, and a series of articles, which had appeared in the *Clinical Journal* made up the main contents of a small volume, entitled "The Advance of Orthopædic Surgery" which appeared in 1925. In 1928 he wrote his last article for THE LANCET, which well illustrated a practical side of his activities as an operating surgeon. This was a series of close observations on the selection and stardardisation of surgical instruments profusely illustrated with microscopical sections of knife-blades in exemplification of their hardness and of the influence of the processes for rendering them stainless. His main conclusion was that the employment of stainless steel instruments in surgical and dental procedure is warranted, as the obvious advantages of economy of time and labour are not accompanied by any loss of hardness.

Sir Robert Jones writes:—"For nearly forty years my old friend, Alfred Tubby, and I have worked together and played together in close companionship. He was delightful both in his study and in the country. It is rare indeed to meet with so much culture in a man who has had to struggle against so many obstacles before arriving at eminence. He was a great reader of the best literature, and proved an inexhaustible storehouse of rare knowledge. He travelled much with a closely observant mind and was quite an authority upon European history; an excellent linguist, nothing escaped him when abroad, and he revelled in the companionship of guide and peasant. He loved the Alps, and more especially the peaks of the Austrian Tyrol in chase of chamoix. His reminiscences of such adventures were always brilliantly recounted. For many years we shared a shoot in Prussia in the midst of deer and wild boar, and stayed with a mutual friend and landowner, Robert Tudor. Many a winter evening we spent in close intimacy by the fireside listening with delight to Alfred Tubby on the habits of animals and his experiences of travel. He was a lovable character, loyal in friendship, and full of understanding. To many he may have appeared aloof and reticent, and even unsympathetic, but this was a veneer covering a very kindly heart."

A professional friend and colleague writes:—"Mr. Tubby held a place in orthopædic surgery in this country that was in some respects unique. He was old enough to be familiar with the traditions of pre-antiseptic days—the days of 'tenotomies'—and young enough to play a large part in the transit of orthopædics from the shadow of cantilevers and turn-screws into the light of operative day. While still at Guy's hospital he had done some research work both in neurology and on the repair of tendons, and he was always alive to the possibilities of clinical research. He was avid of suggestions for modifications of practice, and eager to put them to trial, though he had the strength of mind to drop forthwith those which seemed to him unfruitful or dangerous. He had a flair for the selection of mechanical apparatus and a craftsman's eye for the detection of defect and the economical provision of a remedy. His operative technique was sound, the work patient and painstaking, and he spared no trouble in following up his cases and extracting the utmost possible out of what he had done. He was a sound teacher, never overloading his subject with detail. He possessed a remarkable memory and an enormous experience. He remained a general surgeon to the time of his retirement, but his reputation in orthopædics had brought him a world-wide connexion and his wards were therefore largely filled with bone—joint—and deformity cases. He was a man of keen business instincts, and as dean of the Westminster medical school his services were always of value to the administration of the hospital."

Apart from his professional work Tubby was both an archæologist and sportsman. Taking advantage of his sojourn in Egypt during the war he assisted at excavations which resulted in the communication of papers to the *Bulletin de la Société d'Archiologie*, with the result that he was elected F.S.A. He was a practised mountaineer and wrote on chamois hunting and fishing. A genial and well-read companion, he had, it will be seen, many subjects on which he could and would talk most interestingly.

Mr. Tubby married in 1890 the second daughter of Mr. William Payne, of the Chamber of London, and leaves a widow and one daughter.

Mrs. Tubby was her husband's constant companion, and often shared the joys and labours of his sporting trips abroad.

ARNOLD FRANCIS BILL, M.D. OXF.

Dr. A. F. Bill, whose death from pneumonia in Davos, Switzerland, after only five days' illness, was reported on Feb. 21st, was the son of John Bill, of Coventry, and took his medical course at Oxford University and St. Mary's Hospital, London. He qualified in 1893, going on to the M.R.C.P. Lond. in 1896 and the M.D. Oxf. in 1899. He was house physician and curator of the museum and demonstrator of pathology at St. Mary's Hospital, and was entering on a successful career as physician to St. George's Dispensary in Hanover-square when symptoms of tuberculosis became manifest, and he retired to the Swiss Highlands. With characteristic determination he set himself to take the Swiss Federal Diploma in medicine, a task involving an intimate knowledge of the French language and the ability to pass both preliminary and professional examinations. From 1904 on he practised in Davos, with the exception of two or three years during the war, when he returned to England to take up temporary work as tuberculosis officer in a London borough.

A colleague writes:—"Donnish as to exterior, with a childlike heart, he was often a source of perplexity to his patients, who misinterpreted the far-away look in his blue eyes as a lack of concentration on the immediate necessities of the moment. Latish on, however, after his marriage with Miss Kathleen Fry, he took the position in the English colony which his gifts and his perfect sincerity merited. It is not easily realised by those who have not lived in an Alpine resort to what extent the resident doctor can be their guide, counsellor, and friend, and Bill was never known to fail anybody. He was a consistent supporter of English institutions in the valley, such as the church and library, and was always in demand at social gatherings where children were present, for he had a gift for producing charades and dramatic scenes. He will be much missed."

SIR ALFRED DOWNING FRIPP, K.C.V.O., C.B., M.S. LOND., F.R.C.S. ENG.,

CONSULTING SURGEON TO GUY'S HOSPITAL.

WE regret to record the death, which occurred on Feb. 25th, at his home at West Lulworth, of Sir Alfred Fripp, consulting surgeon to Guy's Hospital, and a prominent figure for many years in the medical and social worlds.

SIR ALFRED FRIPP.

[Photograph by Elliott & Fry

Alfred Downing Fripp was born at Blandford, Dorset, in 1865, being the eldest son of Alfred Downing Fripp, the younger of the two distinguished members of the Royal Water Colour Society whose works are on frequent exhibition in exemplification of Early Victorian art. Alfred Fripp was educated at Merchant Taylors' School and the medical school of Guy's Hospital. A successful student, he graduated at the University of London as M.B., B.S. in 1889, and held the various junior appointments at the hospital, including that of resident obstetric officer. In 1893 he proceeded to the degree of M.S. and obtained the F.R.C.S. Eng., but inclusion upon the staff of Guy's Hospital did not follow until 1899, and during the interval he practised in the country. Upon being appointed assistant surgeon at Guy's he proved himself a good teacher in the medical school, lectured on clinical surgery for many years, and at this period wrote an anatomy for art students, in which he brought his professional equipment into happy conjunction with his practical knowledge of art. He had little or no waiting time in which to make his mark, but was a successful consultant almost from the beginning of his London career, and received a Court appointment unusually soon.

When, in 1900, the South African War broke out, Fripp was appointed Chief Civilian Medical Officer to the Imperial Yeomanry Hospital, and for his services there received the C.B., was mentioned in despatches, and chosen as a member of the Advisory Board for Army Medical Services, whose constitution was one of the outcomes of the prolonged South African struggle and its attendant mishaps. From the Imperial Yeomanry Hospital during the war Fripp wrote for THE LANCET a long and interesting series of communications. In the course of these letters, while the details were given of all the circumstances under which some 2000 patients were cared for from day to day, Fripp wrote a well-informed gossiping summary of the general march of events. In this, like all at home, he was unduly hopeful of an early cessation of hostilities, but he was able to correct a good many false impressions. At the close of the war he was knighted, and in 1906 was created K.C.V.O., and appointed surgeon in ordinary to King Edward VII.

Sir Alfred Fripp became at this period, and later, well known for his public services in connexion with the great London charities. He was a member of the advisory committee of King Edward's Hospital Fund for London, and a member also of the councils of both the Hospital Sunday and Hospital Saturday Fund. To all of these organisations he devoted much energy, and the time was well spent, for Fripp was essentially a man of the world making an excellent personal link between the medical profession and other walks of society. His intimate connexion with theatrical life, shewn by regular appearance at the theatre as a first-nighter, was often used in the cause of philanthropy; similarly an oddly-named association, stated to owe its origin to Fripp, has been the channel of well-directed generosity.

At the outbreak of the late war Sir Alfred Fripp made no secret of his disappointment that the activities of the Advisory Board for Medical Services were not called upon, for his experiences in South Africa would, he considered, have been of tried utility, a utility which might have been increased by his intimate knowledge of public affairs. He was able, however, to play an active part through his immediate appointment as consulting surgeon to the Royal Navy, while in a civilian capacity a large number of seriously wounded passed through his hands. His private surgical practice remained throughout a large and very varied one, but he made few statements in respect of his work at medical societies, and was the author of nothing but one or two scattered papers; the well-written letters from South Africa, as our correspondent, were probably his principal literary output. But the general expressions of regret when the time came for him to sever his active connexion with Guy's Hospital showed how real was the impression he had made upon his colleagues and pupils as an earnest worker for the institution.

Sir Alfred Fripp married in 1898 Margaret, daughter of the late Mr. Thomas Haywood, of Reigate, by whom he leaves two sons and three daughters. Lady Fripp's work on behalf of the less fortunate members of the medical profession and their families is well known to all our readers.

JOHN LLEWELYN-JONES, M.D. LOND.

DR. Llewelyn-Jones, whose death we recorded last week, was 57 years of age, and qualified from the medical School of University College, London, in 1897. He was then house physician and senior obstetric assistant to the hospital, posts which enabled him to take his M.D. Lond. in the minimal interval of a year, and to enter general practice with a solid basis of clinical experience. After a few years in Luton he removed to Gerrards Cross, where the major part of his life was spent. The career of a successful general practitioner does not afford much material for biography. Llewelyn-Jones wrote no medical books; he attended no medical meetings, for his time was always fully occupied in the homes of his patients and at the Cottage Hospital, of which he was one of the founders. His skill in diagnosis was exceptional, and with it he combined the qualities of a fighter—quickness of judgment, resource, determination, and a great courage. He took a keen interest in many forms of sport and one of his friends cherishes the memory of his delight in tramping behind a well trained setter over grouse moors or casting for salmon in a Highland river. Altogether he was a cheery comrade and one who could hold his own in any company. He died as he would have wished, at the height of his activities, his death being due to a pneumonia which early involved both lungs. His work needs no memorial other than the trust and respect which he inspired in a large circle of South Buckinghamshire.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

MENTAL TREATMENT BILL.

(Continued from p. 435.)

Sir BOYD MERRIMAN said he could not agree that the words "incapable of volition," which had been chosen to define the cases in Clause 5, were the best that could be selected. This clause was the heart of the Bill and he did not in the least want to destroy it. He wanted the clause to be read and worked so as to conform with what he understood was the real object of the Bill. The Royal Commission made it a definite recommendation that, on the one hand, it was desirable, in talking about lunacy without giving any rigid definition of lunacy, to adopt a nomenclature acceptable to modern medical thought; and, on the other hand, they said they thought that a greater uniformity of language ought to be devised than was found in the present Lunacy Act. They also pointed out that there was already in the code a large variety of tests or functions of people's state of mind. For instance, there was the main definition of a lunatic as a person, an idiot, or person of unsound mind. There were in various sections differences as wide as this: a person of unsound mind who was incapable of managing himself and his affairs. Another case was that of a person of unsound mind who was incapable of managing his affairs, but capable of managing himself, and was not dangerous to himself or others. In another section was a man of unsound mind, admittedly a lunatic, whose lunacy was in its nature temporary, and would probably soon be removed. That looked like the class of case they were trying to deal with in Clause 5. Again, there was another type of person who, though not found to be a lunatic and not detained as a lunatic, was described as being a person who, through mental infirmity arising from disease or age, was incapable of managing his affairs. With all those definitions no attempt had been made in the Bill to introduce more uniformity into the description of people suffering from unsoundness of mind. They had instead added the entirely new conception of what were called "non-volitional" cases—a particular definition of a class which had never been used before in connexion with lunacy. The phrase really defeated the object of the Bill, because it was impossible to describe people who were said to be incapable of the volition as an intermediate class between voluntary boarders and certifiable lunatics. To him, as a lawyer, incapacity for volition without any limitation at all was indicative of the most complete unsoundness of mind that could be indicated. Absence of volition was the criterion in law for incapacity to contract, to make a will, even, if they liked to be guilty of a crime. They could not describe anybody as being more of unsound mind than to say that he or she was, in every respect, and without any limitation whatever, incapable of volition. Even people who were admittedly lunatics were not necessarily incapable of volition in all respects, but here they were describing this intermediate class, which was supposed to be short of lunacy, as people who were, without any qualification, except in point of time, incapable of volition. There was no limit to it on the face of the words. To talk about removing the stigma of lunacy from people with whom they wanted to deal in this intermediate way and then to describe them as incapable of volition, and leave it at that, was really a contradiction in terms. They were dubbing them for the time being as completely mad in every respect. They had adopted a medical jargon without appreciating all its implications as a matter of law. Mental incapacity to coöperate in a cure did not in the least involve mental incapacity with regard to other affairs. This matter could be dealt with perfectly simply, for the purpose of Clause 5, without stigmatising people as being incapable of volition in all cases, whether for the time being or not, by reversing the wording which was applied to temporary boarders in Clause 1. Instead of dubbing these intermediate people as being incapable of volition, without any qualification whatever, for the time being, they might simply describe them as being people who were incapable of voluntarily submitting themselves to treatment for mental disorder. They would then avoid any question of using a phrase which made them appear to be more mad than the lunatic himself, and which definitely threw a reflection on the patient and on his capacities in any other respect.

Safeguarding the Doctor.

With regard to the protection of medical men, everybody was agreed that it was essential to make it as difficult as possible to attack them in connexion with this procedure. The known reluctance of medical men to certify, because of the risks which attached to it, was a very serious matter in connexion with lunacy proceedings. There was no half-way house between complete immunity for the medical profession on the one side, which had not been seriously put forward, and their liability to be attacked in cases where there was bad faith or negligence. It was in connexion with the provision of safeguards in the latter class of case that the difficulty arose. There was always the risk that a person might be able to get a case on its legs against the doctor. In addition to the real and substantial safeguard provided of going before the judge, who had to be satisfied not merely that there was an allegation of bad faith or of negligence, but that there was sufficient ground for that allegation, he suggested that there should be another safeguard on the analogy of the safeguards which were provided with reference to poor persons' litigation. Before a person was permitted to sue there was an independent committee of investigation. It should be quite possible in the present case, and it would be in the interests both of the public and the medical profession to have a voluntary panel of investigation set up, appointed, if they liked, by the Lord Chancellor and the President of the British Medical Association. There should be some independent body like that to investigate any claim which a person who had been certified desired to bring against a doctor, and make a report to the judge for the assistance of the judge before he was called on to make up his mind whether the proceedings should go on. That was in one sense a matter of detail, but it was of very vital importance. In the interests of the efficient working of the Lunacy Acts, if the doctors could not be given complete immunity they should nevertheless be safeguarded as much as possible.

Reply to the Debate.

Miss SUSAN LAWRENCE (Parliamentary Secretary to the Ministry of Health), replying to the debate, said that it was very seldom that a Bill was received with such general favour as this one. All the points and objections raised were in essence committee points. If there were any better words which would better express the intentions of Clause 5 the Government would be glad to consider them. With regard to the protection of the medical profession, which was dealt with in Clause 16, if they could deal with that matter more satisfactorily in committee well and good; but she very much doubted whether the intelligence of the committee would be able to deal with it any better than had already been done. As to the money which it was stated the local authority ought to have in order to discharge their duty she would point out that that duty was already upon them. Every single person was under care at the moment in asylums or by somebody. The duties imposed on local authorities were permissive. Some local authorities had already passed special Acts of Parliament. The Bill placed other local authorities in exactly the same position as London. It was perfectly true that the Royal Commission said—and the Government had put it in the Bill—that the Board of Control had many imperfections. Dr. Bentham had said that she found the Board of Control very good, but a highly mysterious body. She (Miss Lawrence) did not wonder, if they looked at the defects which the Royal Commission found. First they found that the Board was understaffed and that its duties entailed much travelling over the country. The Government proposed to remedy that and to bring the Board of Control into much closer relations with the Ministry of Health than ever it had been before. It would be more in the position of a Department of the Ministry. The Chairman to be appointed by the Ministry of Health was to be an executive officer—that was to say, in the position of head of a department, and the House need not be afraid that there would be no Parliamentary control.

The Bill was read a second time.

THE SECOND READING OF THE BILL.

On the motion for the second reading of the Mental Treatment Bill in the House of Commons on Feb. 17th,

Borderline Cases

Dr. VERNON DAVIES said he felt that the Bill was of so much importance that the House was entitled to consider it further on one or two points which so far had not been mentioned. It was not a lunacy Bill; it was not a mental defective Bill. It was a Bill to get at the unfortunate cases before lunacy and certification were reached. That brought forward a most important point which had not been sufficiently stressed, and that was the case of the voluntary boarder or voluntary patient. One of the most tragic events in any family was the suspicion that one member might be mentally unbalanced; on the top of that was the fear that this might lead to insanity; and after that, if the case unfortunately did become insane and the patient was certified, there was the horror and shame and the stigma which remained upon the whole family. In the case of adolescent children it might very well affect their future life. The result was that in all classes of life families had done all they could to hide these cases. On the earliest suspicious sign of mental instability they went to their doctor. One of the most tragic things that could happen to any man in private practice—it had often happened to him—was when a poor patient, perhaps a woman, worried to death and with little money, her husband out of work, found that she could not sleep, that her nerves gave way, and she asked "Oh, doctor, am I going mad?" Then there was the ex-Service man who had been struggling against adversity, and fighting against overwhelming odds, until he overbalanced for lack of treatment. There was also the business man who under the stress of modern life worried until he reached the point where he broke down, and they had records of suicides and other troubles. Would it not be better if it could be arranged that these people should know that treatment, absolutely separate and distinct from any suggestion of insanity, was available for them? If a man had an illness of the lungs he went to a doctor or to a hospital, had his ailments diagnosed and underwent the appropriate treatment. But once the word "mental" was mentioned a patient became worried, and what they needed was a change in the public idea towards mental illness. It should be regarded just as physical illness was regarded, and the public should get the idea that it could be treated with the hope of effecting an improvement. The House of Commons had a great opportunity. The Minister of Health had been even braver than the Royal Commission. The report of the Commission marked a distinct advance, and the Minister had advanced a little beyond that report. He (Dr. Davies) would like to see the House advancing a little beyond the Minister. Let them take their courage in their hands and say that they were determined to recognise mental illness in the same way as physical illness and not as insanity. The Bill fell short of carrying out that idea. The Bill said that the voluntary patient might be received after he had given notice, or in the cases of an infant after notice had been given on his behalf, and the case was then to be notified to the Board of Control. That spoiled the whole scheme. He had nothing against the Board of Control, but in the eyes of the public the Board of Control meant the case was one of lunacy. Suspicion would be aroused, and among working people and uneducated people there would be no voluntary patients at all on account of the stigma and the fear of lunacy. The Minister ought to be courageous and advise the House and the country to treat the voluntary boarders as patients suffering from a physical illness pure and simple. In no circumstances should they be notified to the Board of Control, unless special arrangements were found necessary in the case of infants sent in by parents or guardians. By this means they would induce the people they wanted to get at to submit to treatment.

"Temporary" Cases.

When they came to the other cases the great danger was going to be that every case in the future that was not a voluntary boarder would be called a temporary case, because no doctor would commit himself to saying that a patient could not get better in six or twelve months. Prognosis in mental disease was not easy, and no doctor, for his own sake, would say "I will certify this case as a lunatic, and there is no chance of recovery." The doctor would hope that the cases would improve within the six or twelve months and would put off the stigma of certification as long as they could. There was no reason why they should not do that, and he thought that Sir Boyd Merriman had looked at the matter too much from the legal aspect. He (Dr. Davies) thought that the Board of Control was the only safeguard for patients, because they were an independent body of medical and legal men, with some others, having expert knowledge of administration and lunacy or mental work, absolutely unrelated to any of the local authorities, and having the interest of the patient at heart. They wanted to see first of all that the patient was in proper circumstances, in a proper building, and that he was properly treated; and they had the power of compelling the patient either to be discharged as cured or certified if necessary. They were absolutely independent of all parties, except the Minister of Health. It was practically an impossibility for any patient to-day to be improperly detained. He would increase the powers of the Board of Control, and would make them responsible to the House of Commons, but he would not in any circumstances allow them to have anything to do with voluntary boarders. One of the great defects of the Bill was that voluntary boarders might go to mental hospitals—that was to asylums. That was absolutely ridiculous and fatal. Borderline nervous cases would go into mental hospitals and mix with real cases of insanity, and that would be just the sort of thing to topple the former cases over the line. These cases should be sent as out-patients to other hospitals. There were three hospitals that had these patients, one at Cardiff, one at Oxford, and the Middlesex Hospital in London. The Bill gave the power to extend that. He felt strongly about this Bill, because they were at the parting of the ways. This was going to be an epoch-making measure, and he wanted the Minister of Health to have the credit of it, because he had had the courage to go a little beyond the report of the Royal Commission. He wanted the House to have the courage to go even beyond the Minister in the direction which he had indicated.

Are Safeguards Safe?

The safety of safeguards for the medical profession had been raised. The safeguards in the Bill were absolutely valueless, because he would be a very poor lawyer who could not make out a prima facie case to satisfy any judge, and he did not think the remedy of Sir Boyd Merriman was very much better. He recognised that it was a defficult thing to deal with, but he asked the House to bear in mind that the medical profession was an honourable profession. They really tried to do the best they could for their patients, and they had no desire to see people locked up or certified as insane when they were not insane. Doctors at the present time, owing to the difficulties which had arisen, refused to certify cases, and they would find that doctors would refuse to recommend under this Bill. There was a simple way out of the difficulty. Why should not the Board of Control when they came across a case where a certification was wrong, as where it was alleged that a medical man had betrayed the trust reposed in him, and had kept under control a patient who ought not to have been kept under control, refer the facts to the General Medical Council? If the Council said "we believe the charge to be true" and struck the doctor's name off the roll, that action would *ipso facto* be evidence in support of any proceedings taken against him to recover damages. By these means they would get out of all legal quibbling.

THE BILL IN COMMITTEE.

A Financial Resolution.

The second reading of the Bill having been agreed to without a division, the House proceeded in committee to discuss the following financial resolution in connexion with the measure:—

> "That, for the purposes of any Act of the present Session to amend the Lunacy Acts, 1890 to 1922, and such of the provisions of the Mental Deficiency Acts, 1913 to 1927, as relate to the constitution and organisation of the work of the Board of Control, the exercise of the powers of the Board and the protection of persons putting those Acts into operation, it is expedient to authorise the payment out of moneys provided by Parliament—(*a*) of such salaries as may be fixed by the Minister of Health with the consent of the Treasury to the chairman of the Board of Control and to such number of senior commissioners, commissioners other than senior commissioners, and assistant commissioners as may be fixed; and (*b*) of such annual superannuation allowances, additional allowances, and gratuities under the Superannuation Acts, 1834 to 1919, as may, by virtue of the said Act, become payable to persons who, being persons in the service of a local authority in respect of whom contributions have been paid under the Asylums Officers' Superannuation Act, 1909, are appointed to be commissioners or assistant commissioners, or to the legal personal representatives of such persons."

The Board of Control.

Sir **Kingsley Wood** said if they passed the resolution they gave authority, subject to any alterations which might be made in committee, for a reconstitution of the Board of Control. The Board had responsible and important duties. The criticisms levelled at the Board had not been in regard to personnel, or the manner in which they were carrying out their duties, but that there were not a sufficient number of commissioners, and that the staff was inadequate. Most members of the House recognised that the difficult and delicate work of the Board had been carried out satisfactorily, and that statement was borne out by the report of the Royal Commission. His (Sir Kingsley Wood's) criticism was not directed in any way at the Board of Control, but rather to examine before they authorised the payment of these salaries under the new constitution, whether they would improve the Board by the suggestions in the financial resolution and in the Bill. He would like to know what justification there was for the division between senior and junior commissioners? In the present Board of Control the members were equal in status, and were recognised as full members. Would it detract in any way from the position and influence of the Board to make this division? The commissioners would have to visit many important institutions, and Parliament should give them all possible authority in order that they might carry out their work. He also wanted to know whether the Minister of Health would see that there were enough commissioners for that purpose. Did the right hon. gentleman contemplate a lay representative and a woman on the Board? Dealing with superannuation, Sir Kingsley Wood said that he understood that in the case of an officer who was now a servant of a local authority and was appointed one of the assistant commissioners, the years of service he had had with the local authority would count for pension as if his services had been rendered the whole of the time under the State. He would like to have confirmation of that from the Minister of Health.

The Minister's View.

Mr. GREENWOOD (Minister of Health) said that it was clear that the present organisation of the Board of Control was not such as might ensure effective administration. It was difficult to have a body—a soviet of people—all co-equal who were engaged on the business of visitation in the country and central administration at headquarters. It was clear that to get effective administration on the lines laid down in all other departments they should differentiate between those who had final responsibility and those who were concerned with visitation and inspection. The distinction made in the Bill between senior commissioners and other commissioners, including the assistant commissioners, was made in order that they could get this clear demarcation—the senior commissioners would be primarily engaged on central administration, control, and policy; the other commissioners would be primarily engaged in the work of visitation and inspection in the provinces. That was according to sound methods of administration. Provision would be made that at least one commissioner should be a medical commissioner, and that at least one should be a woman. The intention at present was that there should be two medical commissioners, one legal commissioner, and one woman. The Chairman in addition to the four would not be lay in the sense of being neither legal nor medical, because after all they were being called upon to undertake responsible executive and administrative duties, some of which were legal and some medical in their character. These people must be experts; they were going to be the senior officers of this branch of the public service. The question of the commissioners' salaries, emoluments, and pensions was one for discussion and agreement with the Treasury, and such discussions were going on at the present time. As was laid down in the Financial Memorandum, it was not anticipated that the additional cost from the development in contemplation would be more than £6000 a year. Quite clearly people who were to have such heavy responsibilites with regard to mental disease as the Board of Control must be people who had considerable knowledge of this question, and as vacancies occurred it might be desirable to reinforce the staff from people who were engaged in the mental hospital service. But it was difficult to attract these people into the service, because, as the law stood now, they lost their superannuation rights, and because cases might occur where men would not serve a sufficient number of years—the necessary minimum was ten years—to qualify for the pension he would have got had he continued in the local government service. The arrangements under Clause 11 of the Bill were designed to get over that difficulty by spreading the burden of superannuation over the Board of Control service and the service of those public authorities under which the commissioner had served in the mental hospital service.

After further debate the financial resolution was agreed to.

On the following day, Feb. 18th, the resolution was agreed to by the House on report.

Power to Receive Voluntary Boarders.

The Mental Treatment Bill was considered by Standing Committee A of the House of Commons on Tuesday, Feb. 25th. Mr. CECIL WILSON was in the chair.

On Clause 1 (Power to Receive Voluntary Boarders)

Dr. VERNON DAVIES moved to leave out the words "for mental disorder," making the clause begin "any person who is desirous of voluntarily submitting himself to treatment," &c. He said that the horror of lunacy was sufficient in many cases to send patients over the border line. He hoped that they would in this part of the Bill get as far away from the idea of lunacy as possible, and endeavour to put mental illness on the same plane as physical illness. In moving all his amendments to this Bill he was acting independently, but this particular amendment was in accordance with the view of the Medico-Psychological Association. The object was entirely the good of the patient.

Mr. GREENWOOD, Minister of Health, said that if the words were left out as suggested by Dr. Davies it would appear as if the treatment was of a general character for any kind of ailment. There must be a name for mental disorder, and it must be described.

Lieut.-Colonel FREMANTLE said he was sorry that the Minister of Health took that line. He (Colonel Fremantle) wished to reinforce what Dr. Davies had said. To keep in the words "mental disorder" would definitely cut out certain of the patients who were in the early stages of mental disorder, but whose minds were perfectly clear.

Mr. RHYS DAVIES supported the amendment.

Mr. C. WILLIAMS suggested that for the word "disorder" sickness or illness should be substituted.

Dr. MORRIS-JONES said that he could not absolutely gree with Dr. Davies and Colonel Fremantle, but he went a certain way with them. He did not like the phrase "mental disorder," and he thought that "mental illness" would be better.

Mr. GREENWOOD said that if it would ease the opposition to the clause he would be prepared to substitute the word "illness" for "disorder."

Sir B. PETO said that that hardly met the case, because the treatment was to be preventive as well as curative.

Sir D. NEWTON suggested that the matter might be deferred until the next meeting of the Committee in order to allow the Minister to give it further consideration.

Mr. GRENFELL said he understood that the object of this clause was to make it possible for a person to go into an institution without implication of any kind.

Dr. DAVIES suggested to the Minister that as the word "mental" seemed to be a difficulty he might find some other word to substitute for it, such as "nervous" or "psychological."

Mr. GREENWOOD said they had to face the fact that they were dealing with mental illness. There must be a restriction. They could not alter the title of the Bill to a Bill for the treatment of psychological, nervous, or other unnamed illnesses. The terms lunacy, mental deficiency, and so on, had always been used, and they were well known. Hon. Members were applying a stigma to the term "mental," but they could not get away from the stigma, in so far as it was a stigma, by merely pretending that it had not got a name. He did not think there was anything objectionable in the phase "mental illness," because that had some similarity with other forms of illness. He was quite prepared to try to find another word for "mental" before the report stage, but he could not promise that he would be successful in doing so.

Dr. DAVIES said that he could not accept the term "mental illness," but on the understanding that Mr. Greenwood would look into the question of finding an alternative for the word "mental" before the report stage he would withdraw his amendment.

The amendment was withdrawn.

Other Amendments.

Mr. GREENWOOD then moved to substitute the word "illness" for "disorder" in the clause.

Lieut.-Colonel FREMANTLE said that he could not vote for the amendment. The word "disorder" had a wider application than "illness."

Mr. GREENWOOD said that he thought he was meeting the wishes of the Committee. He thought that Colonel FREMANTLE was alone on the Committee on this point.

Sir G. BERRY said that he was entirely at one with Colonel Fremantle. It was most unfortunate that the Minister should not realise that the real crux of the matter was the retention of the word "mental," which destroyed to his (Sir G. Berry's) mind the object for which this Bill was introduced. He suggested that some other word like "unbalanced," or something like that, should be substituted.

Mr. GREENWOOD'S amendment was agreed to.

Lieut.-Colonel FREMANTLE moved an amendment providing that the person desiring to submit himself as a voluntary boarder should make written application to the person in charge of the institution into which he wished to be received.

Mr. GREENWOOD, while expressing his willingness to accept the principle of the amendment, suggested that the words should be limited to the person in charge, as that person was specially defined in Clause 21 of the Bill.

Mr. KINLEY moved an amendment to the amendment providing that the application should be made to the medical officer of health for the area.

Dr. MORRIS-JONES said that Mr. Kinley's amendment might be possible in the future, but at present it was quite impracticable. Medical officers of health as such did not know anything about lunacy, which required a special training.

Sir BOYD MERRIMAN said he thought that for the protection of anyone in charge of an institution Colonel Fremantle's amendment was very necessary. If any question were to arise as to the liability of anyone in charge of an institution for the detention of a patient he should be able to produce a written application for admission addressed to him and signed by the patient.

Lieut.-Colonel FREMANTLE said that Mr. Kinley's proposal would not be practicable. He was grateful to the Minister for meeting him on this point, and he was quite willing to accept the shorter form which Mr. Greenwood suggested.

The original amendment, in the form suggested by Mr. Greenwood, was agreed to.

Mr. Greenwood moved a series of amendments, the object of which were to substitute the phrase "voluntary patient" for "voluntary boarder" in the Bill.

The amendments were agreed to.

The Board of Control and the Voluntary Boarder.

Dr. **VERNON DAVIES** moved the first of a series of amendments designed to secure that the Board of Control should have nothing whatever to do with the voluntary boarders taken under this Bill. He said that he was not against the Board of Control; he was in favour of the Board, and proposed to support them throughout with the exception of this one question of the voluntary boarder. Unless they could get these cases early the Bill would be a failure. They must do everything they could to encourage the people to come for treatment, but if they had to be reported to the Board of Control that would be a great barrier to public confidence, because the question of lunacy would be immediately raised. The only proviso he would make would be in respect of an infant who might be submitted for treatment by a parent or guardian. It might be necessary to see that such infants were safeguarded.

Mr. **GREENWOOD** said that he quite appreciated the point of the amendment. What Dr. Davies was trying to do was to prevent the Board of Control from having to approve every individual case of a voluntary patient to be received into single care. There was probably something to be said for that. But it would be necessary for the Board to approve the persons who made a profession of taking these patients into single care. Conditions would have to be laid down for the recognition of such persons for that purpose, and such recognition must be subject to revocation.

Dr. **DAVIES** said that so long as the Minister recognised his desire that the Board of Control should have nothing to do with the individual voluntary patients his point would be covered.

Dr. Davies's amendment was eventually withdrawn, and words suggested by Mr. Greenwood designed to carry out the same point were under discussion when the Committee rose.

COLONIAL HEALTH SERVICES.

ON Monday, Feb. 24th, the House of Commons went into Committee on a Supplementary Estimate of £4250 for salaries and expenses of the Colonial Office.

Dr. **DRUMMOND SHIELS** (Under Secretary to the Colonial Office), in the course of a statement on the

Work of the Development Fund Committee,

said that it would be agreed that the first essential to any development and substantial improvement in a colony, and to its capacity to afford employment to its own people as well as to people in this country, was that the people in the colonies should be in a proper physical condition. The Colonial Development Advisory Committee had given considerable attention to proposals which had been put before it for improving the health and conditions of the people in the colonies. The Committee had already reported favourably on more than 20 schemes from many parts of the Empire, all of which aimed at improving the health, and thereby the efficiency, of the populations. In Tanganyika Territory money was being provided in connexion with tuberculosis, which was fairly prevalent there. It was hoped that as a result of that work some increased knowledge would be gained as to how to tackle this serious scourge in Africa, and especially in East Africa. Three venereal disease clinics were being established in Swaziland. Approval had also been given for the erection in a West Indian island of a well-planned group of concrete houses to replace insanitary wooden structures. In Somaliland steps were being taken, with assistance from the Fund, to establish a supply of pure water. There were other water schemes and schemes of drainage in connexion with Freetown, Sierra Leone, which had been a very malarious port, and drainage works had been put in hand in St. Lucia and Dominica. A medical training school was being established in Tanganyika for a big, wide development of native medical assistance, which was a very much-needed development in that country. It was hoped, as a result, that a great many African dispensers and sanitary inspectors would be trained. For the inauguration of a sanitary campaign at Antigua £10,000 had been provided, and the neighbouring island of St. Kitts had received visits from highly qualified medical experts and a member of a well-known firm of sanitary inspectors. The total cost of the various projects was about £170,000, of which £112,000 was being met either by direct grants or loans from the Development Fund. He thought the House would feel that money spent in improving the public health of the colonies was money very well spent.

Medical Research and Sanitation.

Mr. **AMERY** said that he was glad that those responsible for the conduct of the Colonial Development Fund had regarded the question of health as being within its scope. Nothing in the long run could lead to greater development of trade with the various colonies than anything which strengthened the health and efficiency of the population. Therefore he welcomed the expenditure on medical research and sanitary work, and hoped that it would continue. Dr. Shiels had referred to the sanitary conditions in the West Indies, and he wished to draw his attention to the defective state of many of the hospitals there. His attention was repeatedly drawn to them when he was at the Colonial Office, but so long as they were necessarily dependent on the revenue of small impoverished colonies, it was a difficult matter to remedy. The Development Fund could step in in a case of that sort, and give assistance in a way in which it was very difficult to get from the Treasury; they would not be justified in getting it from local resources in view of the existing depression in the West Indies. If Nyassaland were to be opened up by the new connexion with the sea, it would be well worth while at the same time relaxing a little the extreme rigour which limited its medical and sanitary services. Anything that could be done to conserve the health of a very fine race of the natives in Swaziland merited attention.

Sir E. **HILTON YOUNG** congratulated the Advisory Committee on taking so wide a view of their functions, particularly as regarded the assistance they were giving to improve health conditions in the tropical colonies, and on the far-sighted and enlightened manner in which they were prepared to give the assistance of the best expert advice. There was a clear example of what one might call the unearned increment to be gained from a very small investment of public money. There were some regions on the East Coast of Africa where whole populations were depressed well below the level of vigorous production by an endemic disease called ankylostomiasis. A small investment of money would result in, as it were, pressing a trigger and shooting the population up to a higher level. One could not have a more conspicuous instance of how State expenditure could occasionally do good.

Scientific Advisory Representatives.

Mr. **ORMSBY-GORE** asked why the authorities did not employ on this Advisory Committee any representatives of modern science. Dr. Shiels had told them that grants were being made for medical research and tuberculosis work in East Africa. Those were very admirable proposals, but he (Mr. Ormsby-Gore) questioned how far the Committee, in its personnel as they had heard it, was fully qualified to decide between those projects which were of major importance and which were of minor importance. He would have felt happier if it were clearly understood that when any project dealing, say, with medical development was under consideration, either the medical adviser to the Colonial Office, the Secretary of the Medical Research Council, or the head of the London School of Tropical Medicine would be asked to join the Committee in order to give the other members of that body full advice as to what was being done elsewhere and the best line to take. Had the Committee established any principle or rule for the distribution of money? Did they, when it came to giving money to establish a particular institution, such as the new medical school at Dar-es-Salaam—if it were at Dar-es-Salaam—give, as a principle, what was called "fifty-fifty?" Did they give half the money to establish the new institution on condition that the territory locally found the other half; or was it clear to colonial Governments that if they put forward schemes for the consideration of the Committee, the Committee was prepared to give more than half the money required? He particularly rejoiced that the Committee was going into the question of health services, and he hoped that the 20 schemes before them in that connexion would only be the forerunners of many more, because he knew of hundreds of cases where some of the major requirements necessary before commercial development and ultimate trade and expansion in that country could be secured, were being held up by the ravages of tropical diseases, which were being fought gallantly by a small band of men and women. It needed the efforts of research workers in this country and out there, and needed further support, financial and otherwise, for the purpose of helping people who knew nothing of modern science [illegible] terrible death-rate and sickness which obtained in those countries with a knowledge of how to protect themselves against infection, and how to deal with [illegible] when they had got it.

Reply to the Debate.

Dr. **SHIELS** replying to the debate, said that in regard to the building of the Zambesi bridge, which was one of the biggest schemes which had been aided, the wording of the contract to ensure the proper housing and [illegible] sanitary services, and the feeding and proper medical [illegible] of all the workers engaged, was at present under negotiation and consideration. He assured Mr. Ormsby-Gore that the Committee had had the feeling that it was [illegible] expert in all services, especially in the health services. On the Committee's initiative a medical advisory Committee was now being formed, apart altogether from the Research Committee, and he thought that probably in time it would become one with the Research Committee. That Medical Committee was being formed in response to the wish of the Committee to have a broad set of principles on which they could base their medical recommendations. The preparations had gone forward, and the Medical Committee was on the eve of being set up.

The vote was agreed to.

HOUSE OF COMMONS.

Tuesday, Feb. 18th.

Oatmeal and the Decay of Teeth.

Lieut.-Colonel Fremantle asked the Secretary of State for Scotland whether his attention had been called to the report of recent investigations at Sheffield University, now being published by the Medical Research Council, which showed that oatmeal promoted the decay of teeth; and whether he would publish recommendations for remedying this danger in the Scottish national dietary.—Mr. Johnston, Under Secretary of State for Scotland, replied: I have been informed of this report which extends and amplifies previous accounts of these important investigations into the relation of diet to the proper development of the teeth. The results do not show that oatmeal and other cereals are necessarily deleterious, but that they increase the body's requirements of vitamin D. The fact of the matter is that our people had far better teeth when they were consuming more meal than they are doing to-day.

Lieut.-Colonel Fremantle: Does the hon. gentleman not realise that it is necessary to show that oatmeal by itself is very deleterious, and that it is necessary to have such things as cod-liver oil or something like that with it?

Mr. Johnston: The same statement has been made about fish, sugar, milk, and other necessaries of life.

Mr. Sanders: Will the hon. gentleman's department take care not to place too much importance upon the varying superstitions and illusions of the medical profession? (Laughter.)

Mr. Johnston: The answer is in the affirmative. (Laughter.)

Lieut.-Colonel Fremantle: Will the hon. gentleman deny the suggestion that the reports of the Medical Research Council under the Government are superstitions and illusions?

Mr. Johnston: No, Sir, but I would say they frequently contradict themselves. (Laughter.)

Miss Rathbone asked if the hon. gentleman would prepare a statement showing what proportion of the agricultural and urban workers of Scotland were in a position to pay for cod-liver oil and other articles of diet recommended?

No answer was given.

Child Malnutrition in Scotland.

Miss Lee asked the Secretary of State for Scotland the number of children suffering from malnutrition in Scottish schools; and what steps were being taken to provide for these children.—Mr. Johnston replied: The total number of children suffering from malnutrition in any year cannot be stated exactly, as complete figures are available only for the three age-groups examined each year. The numbers in these age-groups, the numbers whose nutrition was stated to be below average, the numbers whose nutrition was stated to be very poor, and the percentage ratios which the numbers in these two categories bore to the total numbers in the age-groups examined were as follows in the school years 1924-25 to 1928-29:—

Year.	Numbers in age-groups examined.	Nutrition stated to be below average.	Percentage of total examined	Nutrition stated to be very poor.	Percentage of total examined
1924–25	215,288	15,040	7·0	391	0·18
1925–26	243,595	15,990	6·2	340	0·14
1926–27	237,692	14,956	6·3	364	0·15
1927–28	249,142	16,252	6·7	359	0·14
1928–29	254,044	14,876	5·9	319	0·13

The total number of children on the school registers in 1928-29 was 814,836. If the percentages given above are applied to the whole school population the approximate numbers for 1928-29 would be:—

Nutrition below average	47,749
Nutrition very poor	1,059

The children whose nutrition is below average are not necessarily being underfed, but where it is brought to the notice of the Education Authority, by medical inspection or otherwise, that a child is, owing to lack of food, unable to take full advantage of the education provided, it is the duty of the authority to take steps to provide for the necessities of the case, or to secure that provision is made, by the procedure prescribed in section 6 of the Education (Scotland) Act, 1908. I have no reason to think that education authorities are neglectful of their statutory duty in this matter.

Use of Poisonous Gas in War.

Mr. Ayles asked the Secretary of State for Foreign Affairs whether the use of smoke screens, tear gases, and high-explosive shells producing poisonous fumes were prohibited under the Geneva Protocol (Protocol for the prohibition of the use in war of asphyxiating, poisonous, or other gases, and of bacteriological methods of warfare. Geneva, June 17th, 1925: Cmd. 3398); and, if not, what steps His Majesty's Government were prepared to take in order that the use of poison gas in any form and for every purpose of warfare might be completely proscribed.—Mr Dalton, Under Secretary for Foreign Affairs, replied: Smoke screens are not considered as poisonous, and do not therefore come within the terms of the Geneva Gas Protocol. Tear gas and shells producing poisonous fumes are, however, prohibited under the Protocol. In the circumstances no further action by His Majesty's Government is necessary.

Wednesday, Feb. 19th.

Mental Deficients and Child-bearing.

Major Glyn asked the Prime Minister whether his attention had been directed to certain public statements by His Majesty's judges regarding the consequences of mentally deficient persons bearing children, which resulted in considerable cost to the ratepayers; and whether he would consider setting up a committee to inquire into the whole matter unless this subject could forthwith be referred to an existing commission, so that legislation in accordance with their recommendations might be introduced at an early date.—Mr. Greenwood replied: The reply to the first part of the question is in the affirmative, and the subject has for some time past been under consideration. The issues involved are far-reaching and controversial; they could only be examined effectively by a suitable body specially set up for the purpose; and I fear that I cannot undertake to initiate such an investigation at the present time.

The Malaki Sect.

Mr. Horrabin asked the Under Secretary of State for the Colonies whether he had any information as to the growth in Uganda of the Christian sect known as Malakites; whether the government of Uganda had decided on any steps for the suppression of this sect; and, if so, for what reasons.—Dr. Shiels replied: The Malaki sect, so called from the name of one of its founders, made its appearance in Buganda in 1914, and made rapid progress in many parts of the Protectorate of Uganda during the first two of three years of its existence. The tenets of the sect are based on a literal and distorted interpretation of the Bible, the main plank in its platform being a strong objection to all medical, sanitary, and veterinary measures; an objection which is traceable to the fact that, in modern Luganda, the word employed to signify a medical practitioner is the same as that which, in the Luganda version of the Bible, is used to translate such words as wizard and sorcerer. The policy of the Government towards the Malaki sect from its inception has been one of non-interference, provided its adherents have not, by endangering public health or public property, transgressed against such Ordinances as those providing for the control of small-pox, plague, or rinderpest. The attitude of the members of the sect, as a whole, has been one of passive resistance to medical and veterinary activities, and it is only within the last three years, and then only in a portion of the Bulemezi country of the Mengo district, that any active opposition has been shown. As recently as March last the Governor received reports from all provinces which indicated that the Malakites were steadily decreasing both in numbers and influence. The recent incident referred to in the press was not a general movement, but the work of a few fanatics.

Medical Men in the Factory Service.

Dr. Vernon Davies asked the Home Secretary under what powers he appointed medical men to the factory service; were such medical men under lay control in his department; and, if so, whether, in view of the recommendation adopted by this country at the Washington Conference, he would constitute a separate health department for this service.—Mr. Clynes replied: The medical inspectors of factories are appointed in pursuance of the general powers conferred by Section 118 of the Factory and Workshop Act, 1901, for the appointment of such inspectors as may be necessary for the execution of the Act.

They constitute a separate, but integral, branch of the factory department, and the senior medical inspector who is in charge of the branch acts under the directions of the chief inspector of factories. The answer to the last part of the question is in the negative. As already explained to the hon. Member, in reply to his question of the 11th instant, it is understood that the intention of the Washington recommendation was to secure the establishment of a medical branch in connexion with factory inspection, and this is already given effect to in the existing arrangements.

THURSDAY, FEB. 20TH.

Miners' Nystagmus.

Mr. TINKER asked the Home Secretary, for the year 1928, the number of cases in the mining industry which had been certified as suffering from miners' nystagmus and who had been paid compensation; and the total number of old and new cases at present receiving compensation because of this disease.—Mr. CLYNES replied: The returns for 1928 show that the total number of cases in the mining industry in which compensation was paid for this disease was 9818. These were made up of 7264 old cases and 2554 new cases. I regret that no later figures are available.

Silicosis.

Mr. MARDY JONES asked the Home Secretary whether his attention had been drawn to the hardships inflicted upon the victims of silicosis and their dependents who contracted this industrial disease prior to Jan. 1st, 1929, due to the following conditions laid down in the Various Industries (Silicosis) Scheme, 1928; that no compensation was payable to any workman who contracted silicosis prior to Jan. 1st, 1929; nor where the silica rock worked upon contained less than 50 per cent. free silica; and would he undertake to antedate the operation of the Order by a year or two at least, and at the same time effect a substantial reduction below the present 50 per cent. of free silica in the rocks worked.—Mr. CLYNES replied: The only persons not covered by the Scheme are those who had ceased to be employed in the industries before Jan. 1st, 1929, and while I fully appreciate the hardship which may arise in such cases, I am advised that I should have no power under the Act to give the Scheme any such retrospective application as my hon. friend suggests. As regards the 50 per cent. limit, I would refer him to the reply I gave to a similar question on Nov. 18th last by the hon. Member for Carmarthen. No cases of hardship caused by this limitation have been brought to my notice, but if my hon. friend has any evidence to the contrary I shall be glad to consider it.

Mr. MARDY JONES asked the Home Secretary if he would state how many miners had been granted compensation under the Workmen's Compensation Acts, due to silicosis, in pursuance to the Various Industries (Silicosis) Scheme, 1928, for the year 1929, or for as many quarters of that year as the data were available, showing the total of cases for each coalfield separately.—Mr. CLYNES replied: I regret that no figures are available at present. Returns under this Scheme are collected as part of the general returns under the Workmen's Compensation Act, and as the Regulations under that Act provide only for annual returns, which are not due until March 1st, and as the tabulation necessary occupies a considerable time, I am afraid it will be several months yet before I am in a position to furnish any reliable figures for 1929.

Anthracosis.

Mr. HOPKIN asked the Home Secretary if he is now ready to appoint a departmental committee to inquire into the causes and medical history of anthracosis as it was found in the anthracite district of South Wales, with the view of placing it upon the schedule of diseases under the Workmen's Compensation Act.—Mr. CLYNES replied: I have still no evidence before me to show that the condition of the lungs described as anthracosis is a cause of disablement. The Medical Research Council, however, are setting up, at my request, an expert Committee to institute and coördinate research into pulmonary disease from silica and other dusts, and with the concurrence of the Mines Department I propose to bring the question of the effects of coal dust under the consideration of this Committee.

Treatment of Rheumatism.

Mr. THOMAS LEWIS asked the Minister of Health whether, in view of the fact that diseases classified as rheumatic were responsible for the loss of over 3,000,000 weeks of work per annum by insured workers, necessitating the payment of nearly £2,000,000 in benefit, he would consider the desirability of inaugurating a board qualified to undertake research work as supplementary to, but in conjunction with, the new British Red Cross Society clinic against rheumatism.—Mr. GREENWOOD replied: I shall watch with interest the experiment about to be made by the British Red Cross Society in the treatment of rheumatism at their new clinic, but I do not think it necessary or desirable, at this stage, to set up any special body to coöperate with the Society. The general question of research in relation to rheumatic diseases is constantly under the consideration of the medical research council, who will, no doubt, take steps to acquaint themselves with the results of the work at the new clinic.

Panel Doctors and Expensive Medicines.

Mr. SORENSEN asked the Minister of Health whether doctors were allowed to prescribe medicine for panel patients regardless of cost.—Mr. GREENWOOD replied: Insurance doctors are not only entitled, but required by their terms of service to order on the proper form any drugs or prescribed appliances which are reasonably necessary for the adequate treatment of their patients.

Psittacosis.

Mr. HACKING asked the Minister of Health whether his investigations had brought to light from what part of the world the parrots had come which have been found responsible for infecting human beings with psittacosis; whether they were the green or grey variey; and whether he could assure the public that parrots which had been in this country for a certain period of time, and had not been in contact with the disease, were immune from spreading infection.—Mr. GREENWOOD replied: I understand that the parrots associated with cases of psittacosis in this country have been mostly green parrots imported from South America. As regards the last part of the question, I am not in a position to give any definite assurance, but I am advised that the risk of contracting the disease from a parrot which has been in this country for some months, and has not been in contact with infected birds, may be regarded as negligible.

Local Authorities and Birth Control Information.

Mr. SIMON asked the Minister of Health under what Statute local authorities were prohibited from giving information regarding birth control to nursing mothers, attending maternity and child welfare centres, who needed this advice on medical grounds.—Mr. GREENWOOD replied: I am not aware of any such Statute.

Slum Clearance Schemes.

Miss RATHBONE asked the Minister of Health whether he would so expedite the making up of accounts relevant to the cost of slum clearance schemes under the Housing Act, 1923, that the House might have, at least, approximate figures showing the average expenditure per dwelling incurred out of public funds in, at least, some of the schemes carried out under existing legislation before it was asked to embark on a new policy of slum clearance under the promised new Bill.—Mr. GREENWOOD replied: Although, as I have informed the hon. Member, figures of average annual loss on slum clearance schemes have not in any case been fixed, the final accounts showing the capital cost of several of the completed schemes have been made up, and estimates have been made of the probable average annual loss on the basis of present rents and on certain assumptions as to the selling price of the cleared sites. These estimates show, as regards ten completed schemes under the Housing Act, 1923, for which accounts have been received, an annual loss of about £2 per person displaced from slum areas.

Analysis of Imported Preserved Milk.

Mr. OSWALD LEWIS asked the Minister of Health whether the Government chemist was satisfied, as a result of analyses made by his own department within the past 12 months, that all the forms of preserved milk which were at present being imported into this country in any considerable quantity were nutritious, and that they did not contain anything likely to render them harmful as an article of diet.—Mr. GREENWOOD replied: From the reports of the Government chemist on the samples of imported preserved milk analysed by his department within the past 12 months, I am satisfied that all the milks examined were nutritious, and that they did not contain anything likely to render them harmful as an article of diet.

MONDAY, FEB. 24TH.

Age of Marriage in India.

Mr. SORENSEN asked the Secretary of State for India what was the present minimum age for marriage in India; and whether he was aware of any protests by Indian natives against the recent law relating thereto.—Mr. WEDGWOOD BENN replied: The recent Act, which comes into operation on April 1st next, penalises the contracting, performance, or promotion of a marriage if the husband is less than 18 years of age, or the wife less than 14. Protests against the Act have been made.

Women's Medical Service in India.

Major GRAHAM POLE asked the Secretary of State for India whether an annual contribution was made by the Government of India to the Women's Medical Service for India; and, if so, whether he would state the amount of this grant, and the manner in which it was administered.—Mr. WEDGWOOD BENN replied: An annual grant of Rs.3,70,000 is made by the Government of India to the National Association for Supplying Medical Aid to the Women of India, towards the cost of the Women's Medical Service. The grant is administered by the Council of the Association.

The League and Illicit Drug Traffic.

Lieut.-Colonel FREMANTLE asked the Home Secretary whether, as a result of revelations recently made before the League of Nations Advisory Committee on Opium, he was taking any steps to secure coördinated legislation and closer coöperation between the different countries concerned in the illicit manufacture and distribution of dangerous drugs.—Mr. SHORT, Under Secretary to the Home Office, replied: The Home Office has, for a long time past, done everything in its power to promote coöperation in the enforcement of the international conventions relating to dangerous drugs, and in the suppression of the illicit traffic. As the hon. and gallant Member will be aware, the League's Advisory Committee, on which His Majesty's Government is represented, has given constant attention to this question, and as a result of the recommendations which they have drawn up very great progress in the direction of coördinated action and closer coöperation has been made. The discoveries referred to in the question were, in fact, made as a result of the coöperation between the authorities of several countries. I understand that the Advisory Committee, in the report which it has submitted to the Council of the League on the proceedings at its recent meeting, has made further recommendations on the subject, and these will receive the careful and sympathetic consideration of His Majesty's Government.

Sale of Stale Fish.

Mr. ARTHUR MICHAEL SAMUEL asked the Minister of Agriculture whether he would frame regulations of a kind calculated to discourage the sale of stale fish for curing or smoking or for consumption in fried fish shops, and thereby induce the fishing industry to observe more cleanly methods of packing and storage at sea so as to avoid fish being landed in a stale condition.—Mr. BUXTON replied: Adequate safeguards against the exposure for sale of fish intended for the food of man, but unfit for human consumption, already exist by virtue of the Public Health Acts, under which such fish may be condemned and the owner or person in possession may be fined or imprisoned. As stated in the report on the Handling and Storage of white fish at sea, which the hon. Member presumably has in mind, the term "stale" is used in a comparative sense, and does not denote that the fish is unfit for human food.

TUESDAY, FEB. 25TH.

Stamp Duty on Patent Medicines.

Mr. LONGBOTTOM asked the Secretary to the Treasury if he was aware that bottles of phosferine were being sold by grocers at 1*s.* 3*d.* each, upon which a revenue stamp of 3*d.* had been affixed, and that similar bottles were being retailed by chemists at 1*s.* 3*d.* each without revenue stamp; and, if so, what was the explanation.—Mr. PETHICK-LAWRENCE replied: The prices of medicines are not subject to official control. A regards the revenue stamp, the law exempts medicines from medicine stamp duty under certain conditions when they are sold by qualified chemists, but not by grocers.

Mr. LONGBOTTOM asked if the hon. gentleman was aware that this was the first of a series of evasions of the stamp duty for patent medicines, and whether, as manufacturers of patent medicines were pocketing the money that hitherto they had paid for stamp duty, he would consider the possibility of introducing legislation in the interest of the national revenue, to stop this wholesale profiteering.

Mr. PETHICK-LAWRENCE said that all this arose out of recent legislation, and if it should be proved that there was evasion, no doubt the matter would be considered.

Mr. LONGBOTTOM asked if the hon. gentleman knew that the wholesale price of phosferine was 13*s.* per dozen, and that the stamp duty on its sale by grocers should be 6*d.* instead of 3*d.*

Sir G. HAMILTON asked if the hon. gentleman knew the price charged by the Co-operative Societies.

Mr. PETHICK-LAWRENCE said he had no information on that point.

Consumption of "Red Biddy" in Scotland.

Mr. McELWEE asked the Secretary of State for Scotland whether he could report to the House the result of his promised examination into the injurious effects of the alcoholic beverage known as "red biddy"; and whether he had any evidence to show that this intoxicant was produced in any substantial degree in Leith.—Mr. ADAMSON replied: The inquiries which I have so far made indicate that there is a considerable sale of cheap red wines in Scotland, and that the term "red biddy" is sometimes applied to such cheap red wine, and sometimes to a mixture of the wine and methylated or other spirits. There is no evidence of the manufacture or sale in Scotland of beverages containing such mixtures, but there is reason to believe that these mixtures are made by some purchasers of cheap red wine. The effects of such mixtures are most harmful. I am informed that a considerable quantity of red wine is manufactured in Leith. I am awaiting medical reports on the subject

Milk Tests in Scottish Schools.

Mr. HURD asked the Secretary of State for Scotland how many children in how many schools would be included in the liquid milk tests in Scottish schools; and what experience of the nutritive value of liquid milk food had led to this educational experiment.—Mr. ADAMSON replied: A total of 20,000 children in 68 schools of the Lanarkshire Education Authority will be included in the present investigation into the value of an additional daily ration of milk in the dietary of the school child. Of these children, 10,000 will receive milk and 10,000 will receive no ration, but will be weighed and measured for comparison. The present investigation follows the two years' investigation on a small scale conducted in 1926–1928, and reported in the annual report of the Scottish Board of Health for 1928. The results of that investigation showed that the addition of milk to the diet produced a marked improvement in the physical condition of children of all school ages, and justifies an investigation on a scale sufficiently large to give conclusive results.

Miners' Nystagmus.

Mr. SHIELD asked the Secretary for Mines the number of miners in the coal-mines of Great Britain certified to be suffering from miners' nystagmus for the years 1923, 1924, 1925, 1927, 1928, and 1929; and in which coalfield in the country nystagmus was most prevalent.—Mr. B. TURNER replied: In 1928, the last year for which information is as yet available, the incidence of new cases of nystagmus, in proportion to the number of miners employed, was greatest in Ayrshire. Following are the figures:—

Year.	Cases continued from previous year.	Cases in which first payment was made during year.
1923	7270	3872
1924	7635	3271
1925	7890	3444
1927	7933	1801
1928	7264	2554

Boarding Out of Mental Deficients and Lunatics.

Major GLYN asked the Minister of Health how far negotiations had gone with the appropriate authorities for the accommodation and maintenance of mentally deficient persons and lunatics in cottage homes in rural areas; and if he would give an assurance that nothing of this kind would be done until an opportunity had been given for a discussion in the House?—Mr. GREENWOOD replied: Local authorities already have power to board out mental defectives and persons of unsound mind. Mental defectives have been boarded out with their guardians since the Mental Deficiency Act, 1913, came into operation, and no change of practice as regards defectives is contemplated. The boarding out by visiting committees of persons of unsound mind is provided for under Section 57 of the Lunacy Act, 1890. For various reasons it has not been possible to make much use of this provision; and the only question under consideration is whether greater use could be made of the existing powers, in view of the experience of the system in Scotland and in France.

Maternal Mortality.

Sir HERBERT SAMUEL asked the Minister of Health when it was anticipated that the departmental committee on Maternal Mortality would present its report; and whether the Government contemplated any action for the establishment of a national maternity service?—Mr. GREENWOOD replied: I understand that I may expect an interim report from this Committee during the next few weeks. As regards the last part of the question, this matter is still under consideration, and I am not in a position to make a statement on the subject.

Government and Washington Convention.

Sir WILLIAM BRASS asked the Prime Minister whether it was the intention of the Government to ratify the Washington Convention without reservations?—Miss BONDFIELD, Minister of Labour, replied: Yes, Sir.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdr. W. A. Jolliffe to be Surg. Comdr.

A. J. A. Gray to be Surg. Lt.

ROYAL NAVAL VOLUNTEER RESERVE.

Prob. Surg. Lt. R. M. B. Lowis to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. and Bt. Col. J. S. Bostock to be temp. Col.

Majs. to be temp. Lt.-Cols.: Bt. Lt.-Col. E. T. Potts, G. W. W. Ware, C. J. Wyatt, C. F. White, F. C. Sampson, and T. S. Blackwell.

Temp. Lt.-Cols. to be Lt.-Cols.: Bt. Lt.-Col. E. T. Potts, vice Lt.-Col. J. G. Bell, to ret. pay.

G. W. W. Ware, vice Lt.-Col. R. C. Wilson, to ret. pay.

C. J. Wyatt, vice Lt.-Col. H. St. M. Carter, to half-pay.

Capt. J. R. Williams, Dental Surg., relinquishes his commn.

Lt. on prob. H. C. Benson is restd. to the estabt.

To be Lts. on prob.: R. L. Whittaker, W. J. Officer, J. Beggs, N. H. Lindsay, and is secd. under the provisions of Art. 205, Royal Warrant for Pay and Promotion; T. N. Fogerty.

TERRITORIAL ARMY.

Col. F. G. Proudfoot retires on completion of tenure of appt. and retains his rank, with permission to wear the prescribed uniform.

Col. D. Rorie (ret. T.A.), to be Hon. Col., R.A.M.C. Units, 51st (Highland) Div.

Lt.-Col. (Bt. Col.) H. F. Humphreys, from Gen. List, R.A.M.C., to be Col., and to be A.D.M.S., 48th (S. Midland) Div.

Maj. A. R. Barlas, R.A.M.C., to be Divl. Adjt., 54th (E. Anglian) Div., T.A.

Maj. G. G. Drummond, R.A.M.C., to be Divl. Adjt., 43rd (Wessex) Div., T.A., vice Maj. A. J. Bado, R.A.M.C., who has vacated the appt.

Capt. C. A. Hutchinson, R.A.M.C., to be Divl. Adjt., 52nd (Lowland) Div., T.A.

Capt. W. H. Kerr to be Maj.

Lt. J. Rannie to be Capt.

Lts. F. J. L. Lang and J. G. Morgan to be Capts.

ROYAL AIR FORCE.

Flying Officer C. C. Fenton resigns his short service commission.

INDIAN MEDICAL SERVICE.

Maj. A. N. Palit to be Lt.-Col.

Capt. B. N. Khan and Lt. P. Nath relinquish their temp. commns.

COLONIAL MEDICAL SERVICES.

The following appointments have been made:—Dr. R. G. Spink, Dr. B. A. Taylor, and Dr. E. D. B. Wolfe, Medical Officers, Malayan Medical Service; Dr. D. R. Griffith, Medical Officer, Prince of Wales School and College, Achimota, and Dr. D. E. Stewart, Lady Medical Officer, Gold Coast; Dr. J. D. Robertson, Medical Officer, Kenya; Dr. R. Shelley, Medical Officer, Straits Settlements; and Dr. E. Burton and Dr. D. Murray, Medical Officers, Uganda.

Dr. A. Gaston has been appointed Medical Officer, Nigeria, West African Medical Staff.

Resignation of an Honorary Medical Staff.—The governors and trustees of the Spalding Johnson Hospital recently decided, by a small majority, to alter the rule which required that all members of the honorary medical staff must reside in the town. Outside parishes at some distance away asked for this alteration that they might be treated in hospital by their own medical attendants. Immediately the resolution had been passed the honorary medical staff—Drs. J. H. Power, W. R. Burton, S. H. Perry, and J. R. Munro—handed in their resignations.

A Neurological Unit at Manchester.—In 1926 a small experimental department of neurological surgery was established at Manchester Royal Infirmary, and the results are such as to assure the board of management that there is a demand for full facilities for the treatment of neurological affections. It has therefore been decided to adapt a block of 15 beds and to equip it with an operating theatre and the necessary adjuncts. The cost will be not less than £10,000, and it is claimed that this will be the only unit devoted to the subject in any general hospital in this country.

Medical News.

University of Cambridge.—On Feb. 21st the following degrees were conferred:—

M.D.—N. E. Chadwick and J. A. Struthers.

M.B. & B.Chir.—J. F. V. Lart and T. R. Stevens.

M.B.—J. H. L. Easton.

B.Chir.—Benjamin Wright.

Society of Apothecaries of London.—At recent examinations the following candidates were successful:—

Surgery.—T. Chandrasekharan, Madras and Manchester; B. T. W. Harvey, London Hosp.; C. B. Jennings, Charing Cross Hosp.; T. Singh, Punjab and Charing Cross Hosp.; P. Somasunder, London Hosp.; A. L. Thomas, Guy's Hosp.; and H. Whitby, London and St. Mary's Hosp.

Medicine.—B. T. W. Harvey, London Hosp.; W. A. R. Mailer, St. Bart.'s Hosp.; I. W. H. Mansfield, Middlesex Hosp.; J. E. Moody, St. Mary's Hosp.; S. Ramadas, St. George's Hosp.; and D. Ram Annamalai, London Hosp.

Forensic Medicine.—M. Asaad, St. Mary's Hosp.; L. Banszky, Middlesex Hosp.; K. W. Bruce, Durham; G. P. Charles, Westminster Hosp.; L. P. Clarke, St. George's Hosp; V. J. H. Coidan, Beyrouth and Paris; H. W. E. Dickey, Manchester; I. F. W. Edwards, and A. R. Madden, St. Mary's Hosp.; W. A. R. Mailer, St. Bart.'s Hosp.; I. W. H. Mansfield, Middlesex Hosp.; E. G. Nair, Madras and Manchester; C. Skinner, Guy's Hosp.; and P. Wade, Liverpool.

Midwifery.—R. P. Davies, Cardiff and London Hosp.; R. Frankling, Guy's Hosp.; B. T. W. Harvey, London Hosp.; C. B. Jennings, Charing Cross Hosp.; N. I. Kronengberg, Guy's Hosp.; F. G. Leekam, St. Mary's Hosp.; M. Naylor, Sheffield; D. M. Nightingale, King's College Hosp.; L. Sachs, St. Mary's Hosp.; and P. Wade, Liverpool.

The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery:—D. Ram Annamalai, C. B. Jennings, J. E. Moody, W. A. R. Mailer, I. W. H. Mansfield, M. Naylor, P. Somasunder, S. Ramadas, and H. Whitby.

Post-graduate Course on Mental Deficiency.—The Extension Department of the University of London, in coöperation with the Central Association for Mental Welfare, has arranged a course of lectures, supplemented by clinical instruction, on Mental Deficiency and Conditions Closely Allied to It. It will be in two parts, the first from May 5th to 10th, and the second from the 12th to the 17th. Particulars may be had from Miss Evelyn Fox, c/o the University Extension Department, Imperial Institute-road, London, S.W. 7.

Royal Society: *Smithson Research Fellowship* Our advertisement columns contain particulars of this Fellowship, which is offered for research in natural science, preferably at the University of Cambridge, during a period of four years or more. The stipend is at the rate of £800 a year, with a possibility of increase, and the object of the founder is to encourage the discovery of new laws and principles "rather than the exploitation of what is known."

Maternity and Child Welfare.—A national conference on this subject will be held at Friends House, Euston-road, London, N.W., from July 1st to 3rd, with visits to institutions on the following day. Particulars may be had from Miss J. Halford, at 117, Piccadilly, W. 1.

London School of Hygiene and Tropical Medicine.—The Minister of Health has appointed Sir Harry Goschen to be a member of the Board of Management of this School, in the place of Lord Melchett, whose term of office recently expired. The Board has elected Sir Harry Goschen as its Chairman in succession to Lord Melchett.

People's League of Health.—Twelve lectures on health will be given at 6 P.M. on Mondays, from March 3rd to May 26th (except April 21st), at Hamilton House, Mabledon Place, London, W.C. The lecturers will be Prof. H. E. Roaf, Sir Robert Armstrong-Jones, Prof. M. S. Pembrey, Mr. George Thomson, Mr. A. F. MacCallan, Prof. W. E. Dixon, Miss Margaret Hume, Dr. G. P. Crowden, Dr. C. C. Worster-Drought, Dr. I. Feldman, and Prof. E. L. Collis. The League's address is 12, Stratford Place, W. 1.

Convalescent Home for Middlesex Children.—The administrative committee of the Middlesex King Edward VII. Memorial Fund have decided to purchase Collington Manor, Bexhill, for use as a convalescent and holiday home for necessitous Middlesex children.

University of Manchester.—Dr. W. H. Lang, F.R.S., Barker Professor of Cryptogamic Botany, has been appointed a Pro-Vice-Chancellor in succession to Dr. J. S. B. Stopford, F.R.S., Professor of Anatomy.

Royal Alexandra Hospital.—At this hospital for sick children in Brighton, on Feb. 21st, a gymnasium for orthopædic work was opened by Miss Bower, on behalf of the donors, Mr. and Mrs. H. E. Bower. The roof will be used as a sun balcony for the patients in the isolation wards.

A Youthful Hospital President.—The Marquess Townshend, aged 13, has been elected President of the Eastern Counties Convalescent Home at Yarmouth, in succession to the late Dean of Norwich.

Paying Patients at Glasgow.—A paying patients' block is being erected in connexion with the Victoria Infirmary, Glasgow, and will be ready for occupation in the autumn. It has been decided to charge an inclusive fee to all patients, irrespective of the nature of the case, of £6 6*s.* per week for the first three weeks and thereafter £3 3*s.* until the completion of treatment.

Manchester Accidents.—Every day the Manchester hospitals deal with over 200 accident cases, and more than 80 operations are performed.

A "Trade Ward."—The dressmaking industry has undertaken to endow a ward of 25 beds in the Middlesex Hospital. A committee of prominent members of the trade is raising the £25,000 which the endowment will cost by means of collections among employees, dances, and other entertainments.

Hospitals and Motor Accidents.—Early last year boxes were placed in the office of the Belfast Licensing Department in the hope that motorists when renewing their licences would give a small contribution towards the cost of treating motor accidents in the local hospitals. But although there are about 15,000 drivers in the city area, the total amount contributed was less than £30.

Belfast Maternity Hospital.—The erection of a new maternity hospital of 100 beds, at a cost of £110,000, is about to be begun; it is hoped that there will eventually be a paying unit of 50 beds. Belfast's accommodation for maternity and infant welfare work is described as "about the most inadequate" in the United Kingdom. Of the money required £80,000 is already in hand.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, March 4th.—8 p.m., Pathology. Laboratory Meeting at the Medical College, London Hospital, E. Demonstrations: B. C. J. G. Knight: Technique of Eh Measurements. S. P. Bedson and G. Western: Psittacosis. F. C. Smith: A Bacterial Porphyrin. J. O. W. Bland: Generalised Vaccinia in the Guinea-pig. T. Lumsden: Spontaneous Mouse Tumours H. Cairns and Dorothy S. Russell: The Importance of Examining the Spinal Cord in all Cases of Intracranial Neoplasms. Donald Hunter and Hubert M. Turnbull: Resorption of Skeletal Calcium in Parathyroid Adenomata and Graves's Disease. W. W. Woods: Sacro-coccygeal Chordoma. Ectopic Pancreas in Gall-bladder. A. B. Bratton: Pneumonia in a Case of Psittacosis. Pyogenic Aneurysm of Aorta. 8.30 p.m., Orthopædics. Discussion on Spasmodic Flat Foot. Opener: Mr. S. A. S. Malkin. Followed by Mr. Naughton Dunn and Mr. E. P. Brockman. Other speakers will also take part.

Wednesday.—5 p.m., History of Medicine: Surgery. 8.30 p.m., Pathological Evening.

Thursday.—8 p.m., Tropical Diseases.

Friday.—10.30 a.m., Otology. (Cases at 9.30 a.m.) Discussion on Malignant Disease of the Ear. Papers by Mr. G. J. Jenkins, Dr. J. S. Fraser, and Mr. E. Broughton Barnes. Cases and Specimens: Cases will be shown by Sir James Dundas-Grant and Mr. F. C. Ormerod. 5 p.m., Laryngology (Cases at 4 p.m.). Cases will be shown by Mr. Simpson, Dr. Dan McKenzie, Mr. E. Watson-Williams, Mr. M. Vlasto, and others. 8.30 p.m., Anæsthetics. Papers: Dr. Charles Donald: Spinal Analgesia with Spinocain. Dr. Howard Jones: Percain 'Ciba,' a New Regional and Spinal Analgesic, with Special Reference to High Thoracic Nerve-root (Splanchnic) Block.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.

Wednesday, March 5th.—9 p.m., Sir John Thomson-Walker: Enlarged Prostate and Prostatectomy. (Third Lettsomian Lecture.)

HUNTERIAN SOCIETY.

Monday, March 3rd.—(at the Mansion House, London), Dr. J. Campbell McClure: Psychology and the Practice of Medicine. (Hunterian Oration.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

Tuesday, Mar. 4th.—5 p.m., Dr. J. A. Glover: The Incidence of Rheumatic Diseases. (Second Milroy Lecture.)

Thursday.—5 p.m., Dr. J. A. Glover: Last Milroy Lecture.

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn-fields, W.C.

Monday, March 3rd.—5 p.m.: Mr. C. E. Shattock: On Affections of Lymphatic Glands (Museum Demonstration).

Friday.—2.45 p.m.: Mr. T. B. Layton: Rhinological Anatomy of Naso-frontal Duct and Hiatus Semilunaris.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, Mar. 3rd, to Saturday, Mar. 8th.—Medical Society Lecture Room, 11, Chandos-street, Cavendish-square, W. Tues., 4 p.m., lecture by Prof. Francis R. Fraser on The Uses and Abuses of Digitalis. No fee.—Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C. Tues., 9 a.m., Special Demonstration by Mr. Nicol Rankin: Guillotine Enucleation of Tonsils in Children.—No fee.—Royal Waterloo Hospital, Waterloo-road, S.E.—Thurs., 2.30 p.m., Demonstration on Clinical Laboratory Findings by Dr. F. A. Knott. No fee.—Children's Clinical and Other Hospitals. Post-graduate Course in Diseases of Children occupying afternoons and some mornings. Second week.—Royal Eye Hospital, St. George's Circus, S.E. Series of Demonstrations on the Diagnosis and Treatment of Diseases of the Eye. Mon. to Fri. afternoons daily.—St. John's Hospital, Leicester-square, W.C. Special Course in Dermatology. Clinical instruction daily and lectures on Tues. and Thurs. afternoon.—Hospital for Tropical Diseases, Gordon-street, W.C. Clinical demonstration Tues. and Thurs. afternoons at 2 p.m.—Further particulars from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

Monday, Mar. 3rd.—2.30 to 5 p.m.: Medical, Surgical, and Gynæcological Clinics. Operations.

Tuesday.—2.30 to 5 p.m.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

Wednesday.—2.30 to 5 p.m.: Medical, Skin, and Eye Clinics. Operations.

Thursday.—11.30 a.m.: Dental Clinics. 2.30 to 5 p.m.: Medical, Surgical, Nose, Throat, and Ear Clinics. Operations.

Friday.—10.30 a.m.: Throat, Nose and Ear Clinics. 2.30 to 5 p.m.: Surgical, Medical, and Children's Diseases Clinics. Operations.

KING'S COLLEGE HOSPITAL, LISTERIAN SOCIETY.

Monday, Mar. 3rd.—8.15 p.m., Prof. D. P. D. Wilkie of Edinburgh: Carcinoma of the Rectum and its Treatment.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark Hill, S.E.

Thursday, Mar. 6th.—9 p.m., Mr. A. C. Palmer: Uterine Hæmorrhage.

ROYAL NORTHERN HOSPITAL, Holloway.

Wednesday, Mar. 5th.—3.15 p.m. (at the Royal Chest Hospital), Dr. Barly King: Demonstration of Cases in the Wards.

UNIVERSITY COLLEGE, Gower-street, W.C.

Thursday, Mar. 6th, and Friday, Mar. 7th.—5.15 p.m.: Prof. Otto Meyerhof: Chemistry of Muscle in Relation to Problems of Cellular Physiology. (First two of four public lectures.)

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James Hospital, Ouseley-road, Balham, S.W.

Wednesday, Mar. 5th.—4 p.m., Dr. Charles E Larkin: Demonstration of Medical Cases.

NATIONAL HOSPITAL POST-GRADUATE COURSE, Queen-square, W.C.

Monday, Mar. 3rd.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 p.m., Dr. Riddoch: Out-patient Clinic. 3.30 p.m., Dr. Kinnier Wilson: Neurotubercle.

Tuesday.—2 p.m., Dr. Walshe: Out-patient Clinic. 3.30 p.m., Dr. Bernard Hart: Disorders of Personality.

Thursday.—2 p.m., Dr. Kinnier Wilson: Out-Patent Clinic. 3.30 p.m., Dr. Purdon Martin: Localising Signs of Tumours in the Cerebral Hemispheres.

Friday.—12 noon, Dr Purdon Martin: Anatomy and Physiology of Nervous System. 2 p.m., Dr. Adie: Out-patient Clinic. 3.30 p.m., Dr. Greenfield: Cerebro-spinal Fluid in Diseases and Injuries of the Skull.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

Tuesday, Mar. 4th.—5 p.m., Dr. W. Griffith: Eczema (1).

Thursday.—5 p.m., Dr. W. Griffith: Eczema (2).

ROYAL DENTAL HOSPITAL OF LONDON, Leicester-square, W.C.

WEDNESDAY, Mar. 5th.—6 P.M., Mr. Bowdler Henry: The Inter-relationship of the Mouth and the Bowel.

ANCOATS HOSPITAL POST-GRADUATE COURSE, Mill-street, Manchester.

THURSDAY, Mar. 6th.—4.15 P.M., Mr. E. E. Hughes: Vesical Calculus.

ST. MARY'S HOSPITALS, Manchester.

FRIDAY, Mar. 7th.—4.15 P.M. (at the Whitworth Street West Branch), Post-graduate Lecture, Dr. W. R. Addis: Breech Presentations.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Mar. 4th.—4.15 P.M., Dr. F. E. Tylecote: Treatment of the Cirrhosis of the Liver.

FRIDAY.—4.15 P.M., Dr. Crighton Bramwell: Demonstration of Medical Cases.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

FRIDAY, Mar. 7th.—3.30 P.M. (at the Royal Infirmary), Mr. T. B. Mouat: Surgical Infection of the Urinary Tract.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

WEDNESDAY, Mar. 5th.—4.15 P.M. (at The Lock Hospital, 41, Rotten Row), Dr David Watson: Female Venereal Diseases.

Appointments.

ADAMSON, OSWALD J. W., M.R.C.S., L.R.C.P., has been appointed Honorary Clinical Assistant to the Sussex Eye Hospital.

Vacancies.

For further information refer to the advertisement columns.

All Saints' Hospital for Genito-Urinary Diseases, 91, Finchley road, N.W.—H.S. At rate of £150.

Ashton-under-Lyne District Infirmary.—H.S. At rate of £150.

Bedford County Hospital.—Asst. H.S. £130.

Birkenhead General Hospital.—Sen. H.S. and H.P. At rate of £150 and £100 respectively. Also Cas. O. £100.

Birkenhead Union Infirmary.—Res. Asst. M.O. £200.

Birmingham and Midland Eye Hospital.—Res. Surg. O. £150.

Birmingham Ear and Throat Hospital.—H.S. At rate of £150.

Birmingham, Erdington House.—Res. Asst. M.O. £250–£350.

Birmingham, Queen's Hospital Medical Schools.—Three H.P.'s. H.S. Anæsthetist. Also Dental H.S. Each £70.

Birmingham, Queen's Hospital.—Pathologist and Two Cas. Surgs. Each £100.

Blackburn and East Lancashire Royal Infirmary.—Fourth H.S. £130.

Bootle Borough Hospital.—Two Jun. H.S.'s. Each at rate of £150.

Bristol Eye Hospital.—H.S.

Burnley, Victoria Hospital.—H.P. At rate of £125.

Cardiff Royal Infirmary.—H.S. At rate of £50.

Carlisle City.—Asst. M.O.H. £750.

Carlisle, Cumberland Infirmary.—H.P. At rate of £155.

Central London Ophthalmic Hospital, Judd-street, W.C.—Hon. Dental Surgeon.

Charing Cross Hospital, W.C.—Med. Reg. £150. Asst. Reg. £100. Also Registrar to Ear, Nose, and Throat Dept. £100.

Connaught Hospital, Orford-road, E.—Sen. Res. M.O. At rate of £150. Also Res. H.S. and H.P. Each at rate of £100.

Derby, Derbyshire Royal Infirmary.—Ophth. H.S. £150.

Dreadnought Hospital, Greenwich.—Phys. in charge of Out-Patients.

Edinburgh Hospital for Crippled Children.—Surgeon. £1000.

Edinburgh Royal Infirmary.—Tutor and Sen. Clin. Asst. for Ophth. Dept. £145.

Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.

Exeter City.—Asst. Tuber. O. and Asst. M.O.H. £600.

Great Yarmouth General Hospital.—Sen. H.S. £150.

Hastings County Borough.—Deputy M.O.H. and Deputy School M.O. £600.

Hereford, Herefordshire C.C., Ross Urban and Ledbury and Ross Rural District Councils.—Asst. County M.O. and M.O.H. £685.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. and H.P. Each at rate of £100.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W. Asst. Phys.

Hull Royal Infirmary.—Cas. H.S. At rate of £130.

Ipswich, East Suffolk and Ipswich Hospital.—Two H.S.'s. Each £120.

King's College Hospital, Denmark Hill, London, S.E.—M.O. for Gonorrhœa Dept.

Kingston-upon-Hull, City Fever Hospital and Sanatorium.—Med. Supt. £800.

Kingston-upon-Hull, City and County of.—Tuberculosis Officer. £800.

L.C.C. Mental Hospitals Service.—8th Asst. M.O. £445.

Leicestershire and Rutland Mental Hospital, Narborough.—Med. Supt. £800.

Leicester Royal Infirmary.—Two H.P.'s, also H.S.'s. Each £125

Liverpool, St. Paul's Eye Hospital.—H.S. At rate of £120.

London Hospital.—Director of Dept. for Venereal Diseases. £800.

Macclesfield General Infirmary.—2nd H.S. At rate of £150.

Maidstone, Kent County Ophthalmic and Aural Hospital.—Ophth. H.S. At rate of £200.

Manchester, Ancoats Hospital.—H.S. At rate of £100.

Manchester Royal Children's Hospital.—Two Asst. M.O.'s for. Out-Patients' Dept. Each at rate of £150. Also Res. Surg. O. At rate of £125.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Manchester, St. Mary's Hospitals.—Four H.S.'s to Special Depts. Each at rate of £50.

Middlesex Hospital, London, W.—Surg. Also Asst. Surg.

Miller General Hospital, Greenwich, S.E.—Res. M.O., Cas. O., and H.P. At rate of £250, £150, and £125 respectively.

Northampton General Hospital.—Two H.S.'s, also Two Asst. H.S.'s. Each at rate of £150.

Poplar, Metropolitan Borough of.—Temp. Asst. to M.O.H. £600.

Putney Hospital.—Res. M.O. £150.

Queen Mary's Hospital for the East End, E.—House Anæsthetist and H.P. At rate of £120.

Rochester, St. Bartholomew's Hospital.—H.P. At rate of £175.

Royal National Orthopædic Hospital, Great Portland-street, W.—H.S. At rate of £150.

Royal Northern Hospital, Holloway, N.—H.P. Also Obstet. H.S. Each at rate of £70.

Royal Society, Burlington House, W.—Smithson Research Fellowship. £800.

St. John's Hospital, Lewisham, S.E.—Res. H.S. £100.

Salford Royal Hospital.—H.P. Two H.S.'s. and Cas. H.S. All at rate of £125.

Scarborough Hospital and Dispensary.—Two H.S.'s. At rate of £126.

Sheffield University, Dept. of Pathology and Bacteriology.—Asst. Bacteriologist. £300.

Southampton Children's Hospital and Dispensary for Women.—Res. M.O. At rate of £100.

Southampton County Borough.—Asst. M.O.H. £600.

Southampton, Royal South Hants and Southampton Hospital.—Jun. H.S. Also Cas. O. At rate of £130 and £120 respectively.

Truro, Royal Cornwall Infirmary.—H.S. £170.

West London Hospital, Hammersmith-road, W.—H.P., Two H.S.'s and Res. Anæsthetist. Each at rate of £100. Hon. Asst. Surg., Hon. Med. Reg., and Hon. Obstet. Reg.

Westminster Hospital, Broad Sanctuary, S.W.—Clin. Asst. to Dental Dept. Also Sen. Res. and Cas. O., H.S. to Eye, Ear, Nose, and Throat Dept. Also Asst. Med. Reg. At rate of £104, £102, and £100 respectively.

Willesden General Hospital, N.W.—Clin. Assts.

Willesden U.D.C.—Two Dentists. £572 6s. 4*d*. Also Part-time Anæsthetist and Part-time Oculist. At rate of £300 and £225 respectively.

Windsor, King Edward VII. Hospital.—Res. M.O. £200. Also Sen. H.S. £140.

York County Hospital.—H.S. £150.

The Chief Inspector of Factories announces the following vacant appointments for certifying Factory Surgeons: Denny (Stirling), Eckington (Derby), Halifax (Yorks), Halstead (Essex), and Haverfordwest (Pembroke).

Births, Marriages, and Deaths.

BIRTHS.

BATTERHAM.—On Feb. 21st, at Keyberry House, Newton Abbot, Devon, the wife of Dr. Douglas Batterham, of a son.

ROWLEY.—On Feb. 18th, at St. Brenda's, Clifton, Bristol, the wife of Dr. Rowley, of Wrington, Somerset, of a daughter.

MARRIAGES.

BUMSTED—ROBERTSON.—On Feb. 22nd, at Trinity (Presbyterian) Church, Streatham, Henry James Bumsted, M.A., M.B., B.C., to Margaret Helen, daughter of the late Sutherland Robertson and Mrs. Robertson, of Norbury-crescent, Norbury, S.W.

ROCHE—HUGHES.—On Feb. 18th, in London, Hilary Roche, M.D., M.R.C.P., to Janet Hughes, daughter of Mr. and Mrs. G. Reeves-Smith, Berkeley-street, London, W.

DEATHS.

BASHALL.—On Feb. 19th, at Claremont-road, Surbiton, Charles Edward Bashall, M.R.C.S., L.R.C.P., aged 64.

BILL.—On Feb. 21st, at Davos, Switzerland, Arnold Francis Bill, M.D., aged 64.

CARTER.—On Feb. 21st, suddenly, at Westfield Park, Redland, Bristol, Thomas Moravian Carter, O.B.E., T.D., M.D., aged 61.

FOLEY.—On Feb. 18th, at Worthing, after more than two years illness, Mabel Foley, L.M.S.S.A., aged 63.

LUCAS.—It is with deep regret we have to announce the sudden death of Dr. Gordon Lucas, of Dartford, who passed away at the early age of 27, on Monday morning, 24th inst., after a very short illness, in Westminster Hospital.

TUBBY.—On Feb. 23rd, Colonel Alfred Herbert Tubby, C.B., C.M.G., M.S., F.R.C.S., of The Albany, Hastings, Consulting Surgeon to Westminster and the Royal National Orthopædic Hospitals, aged 67.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

LAVERAN JUBILEE CELEBRATION IN NAIROBI.

THE annual meeting of the Kenya Branch of the British Medical Association this year took the form of a jubilee to celebrate the discovery of the malaria parasite by Alphonse Laveran 50 years ago. Members attended from all parts of the Colony at sessions on three afternoons (Jan. 15th–17th, 1930) devoted to the consideration of various aspects of malaria. The President, Dr. J. H. Sequeira, opened the conference with a historical sketch of Laveran and his place in scientific medicine, and gave a brief account of the developments which followed his discovery. Dr. Kauntze gave a lantern demonstration of the blood changes in the several types of the disease, and Mr. Symes described the incidence of the types of anopheles found in Kenya Colony. The second day was devoted to the clinical aspects of malaria, Dr. G. V. Anderson describing the protean forms under which the disease occurs in Europeans, while Dr. Procter gave a résumé of observations made in the Africans in the native reserves. The major portion of this session was taken up by a debate on the treatment of malaria and blackwater, opened by the Hon. Dr. J. L. Gilks, the Director of the Medical and Sanitary Services in the Colony. Many members participated in a useful and profitable discussion.

The third day was dedicated to preventive measures, and was opened by Dr. Paterson with a historical account of the conditions which led to the disappearance of malaria in those parts of the United States in which pioneer conditions obtained essentially similar to those met with in some parts of the colony. Mr. Leigh-Bennett, the Antimalaria Engineer, read an instructive paper on soils and drainage. Dr. Steel, of the Tanganyika Medical Service, and Dr. de Buer, who has done much good work at Mombasa, discussed the measures suitable for towns, and Dr. Philip gave an account of the measures required in certain native reserves to render the population, debilitated by worm-infection, especially ankylostomiasis, fit to undertake the housing and other improvements required to combat the malarial infection.

The annual dinner, at which 80 members and guests attended, was held at the New Stanley Hotel. H.E. the Governor was represented by the Colonial Secretary, Mr. Monck-Mason Moore.

The Medical Department of the Colony during the week held a Health Exhibition at the Memorial Hall, showing graphically by specimens, models, pictures, &c., how to make Africa healthy. The Governor opened the Exhibition, and he was accompanied by Mr. Neville Chamberlain, who gave an address. No fewer than 15,000 persons, European, Asiatic, and African, attended this educational demonstration of practical hygiene.

NEW PREPARATIONS.

DIGITALIS LEAF TABLETS (Allen and Hanburys, Ltd. Bethnal Green, London E.2).—This is a preparation of digitalis leaves whose physiological standardisation is valuable because it is recognised that digitalis leaves of different batches do not contain necessarily the same proportion of active principles. At the Geneva Conference of 1925 it was decided to adopt as an international standard a mixture of ten different specimens of digitalis leaf, the final mixture being carefully assayed. Preparations, like this, adjusted to the international standard can be relied on to have an unvarying therapeutic activity, and the new drug is presented in a convenient form for prescribing. Tablets Digitalis (A. and H.) each contain 0·033 gramme ($\frac{1}{2}$ grain) International Standard digitalis leaf equivalent to $\frac{1}{3}$ of an International Unit. The recognised daily dose is $\frac{1}{3}$ to 1 International Unit—i.e., one to three tablets. They are supplied in bottles of 100.

SUNNYCOMB (Macfie and Sons, Ltd., 34, Moorfields, Liverpool).—This is a pure invert sugar, a palatable mixture of dextrose and lævulose, suitable for infant food and prepared from sugar cane under close supervision. Its composition is as follows: dextrose 37·5 to 38·5 per cent.; lævulose, 35 to 36 per cent.; sucrose 1 to 3 per cent.; iron, 0·01 to 0·03 per cent.; lime, 0·01 to 0·03 per cent. We have received satisfactory reports on its use, and it can replace sugar for most purposes—e.g., in coffee or with stewed fruit or, as a change from jam, on bread.

ERBOLIN CAPSULES (Stafford Allen and Sons, Ltd., Cowper-street, Finsbury, London, E.C.).—Erbolin is a physiologically standardised and stable ergot, and the preparation should be valuable in view of practical experience with the extract Ergotæ Liq. B.P. Erbolin is powdered ergot in capsule form, and each capsule contains the equivalent of 0·5 mg. (1/200 grain) ergotoxine phosphate. This composition has been determined by a biological test carried out through the Pharmaceutical Society of Great Britain. The capsules are issued in packages of 100, 500, and 1000, duly labelled poison.

"GOSSAMATEX."

THIS is a fabric which has been brought to our attention by the firm of T. M. Lewin, 39, Panton-street, Haymarket. It washes well and does not shrink. It can be supplied in all kinds of materials and garments, in plain or coloured fabrics, and can be made to order. Considerable hygienic claims are made for this substance, and its protective value is certainly aided by its porosity. It is very light and pleasantly soft to wear.

THE CHILD'S DEVELOPMENT.

WE have received a copy of a revised and enlarged edition of "The Progress Book," being an illustrated register of the child's development from birth till coming of age and after by Mr. W. M. Pilley, M.A., printed for Mellins Food Ltd. and published by Mears and Caldwell (Cranmer-road, London, S.W. 9). It is a squarish book of 144 pages containing space to record details of the child's birth, family history, growth in weight and height, important happenings in early life such as his funny sayings and the first attendance at Sunday School, his educational record, leading on to recreations and amusements, clubs and associations joined, with sections for a running account of health and character, and for the insertion of photographs at every year of life, We miss, however, any place of entry for the first and last caning which, as recent correspondence has shown us, plays still such a large part in the upbringing of adolescent boys and even girls. Apart from blank spaces to fill in, there are suggestions of suitable names for boys and girls, what books to read at various ages, and the appropriate speed to gain weight and height. Such intimate details will afford parents pleasure both in recording and recalling, and, should little Willie become a Shakespeare or baby Florence a Nightingale, the record will have retrospective value for the world at large.

"FISGARD."

To the Editor of THE LANCET.

SIR,—The letter of "Etymologist" in THE LANCET of Dec. 14th, 1929, p. 1292, asking for the origin of the word "Fisgard" as the name of a ship, has probably been answered before now. If, however, it has been overlooked, the following quotation from Wheeler and Broadley's "Napoleon and the Invasion of England," Vol. I., p. 52, may suffice: "The *St. Fiorenzo* was appropriately rechristened the *Fisgard* (Fishguard), and in the latter part of the last century was still the receiving ship at Sheerness." The change of name was, of course, in commemoration of, or rather in jubilation over, the easy victory over the French force of about 1200 men under the American Colonel Tate, who landed at Fishguard on Feb. 22nd, 1797, and surrendered ignominiously two days later. Colonel Tate received his orders from Admiral Hoche after the failure of the latter to land and carry on war in Ireland. Details may be found in the book above mentioned, and in many others.

I am, Sir, yours faithfully,
F. LUCAS BENHAM, M.D.

Semaphore, South Australia, Jan. 21st, 1930.

⁂ A letter from "Sea Captain" on this subject appeared in THE LANCET of Dec. 21st, 1929.—ED. L.

ALEXANDRA DAY.

WE are informed by Miss C. May Beaman, C.B.E., the organiser of Alexandra Rose Day, that her address is 33, The Grove, The Boltons, London, S.W.10, and not as previously announced.

THE LITESOME BODY-BELT.

THE Litesome is a body-belt with a scrotal pouch attached made of a washable and unshrinkable woollen material. The suspender is an appliance which not only the subjects of varicocele but the pursuers of many field sports find serviceable, and this belt is well made and should prove comfortable, if a little hot for wear in warm weather.

WE regret that in a report of a discussion on Intrathoracic Tumours, at the Section of Surgery of the Royal Society of Medicine (THE LANCET, Feb. 15th, p. 350), the statements made by Mr. A. Dickson Wright were wrongly attributed to Mr. W. A. White, whose name does not appear on the Medical Register.

Milroy Lectures
ON THE
INCIDENCE OF RHEUMATIC DISEASES.

Delivered before the Royal College of Physicians of London

BY J. ALISON GLOVER, O.B.E., M.D. CAMB.,
M.R.C.P. LOND., D.P.H.,
A MEDICAL OFFICER OF THE MINISTRY OF HEALTH.

LECTURE I.—THE INCIDENCE OF ACUTE RHEUMATISM.

Delivered on Feb. 27th, 1930.

MR. PRESIDENT AND GENTLEMEN,—The founder of these lectures, Dr. Gavin Milroy, in his suggestions for their purpose, desired that they might deal "with chronic constitutional diseases, and with the vast amount of protracted malaise and suffering, disablement or lessened capacity for industrial work, and often, too, of slow but eventually fatal disease." These words aptly apply to the chronic rheumatic diseases, whilst acute rheumatism is now regarded as a specific infectious disease, of great importance in State medicine.

In my first lecture I propose to deal with the incidence of acute rheumatism; in my second to try to resolve "industrial rheumatism" into its constituent parts—a problem which may involve a brief discussion on classification—and to estimate the incidence of non-articular fibrositis; in my third I shall discuss the incidence of various forms of chronic arthritis.

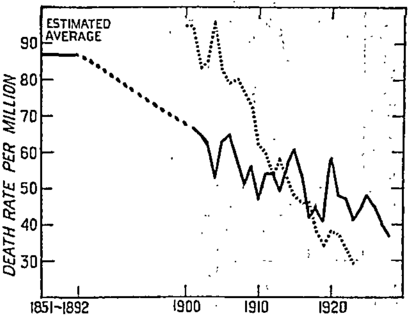
The observation of Sir William Church concerning acute rheumatism, that "it is almost impossible to form any opinion as to the frequency of its occurrence in the United Kingdom," remains only too true, even though we now have new sources of information in national insurance and the school medical service, sources not available to Church, Longstaff, or Newsholme.[1] These advantages, however, do not outweigh the difficulties added in recent years by the enlargement of the diagnosis to include many conditions not previously regarded as rheumatic fever.

MORTALITY STATISTICS.

The immediate mortality of acute rheumatism is very low, generally under 1 per cent. Even in hospitals where the worst cases are admitted, the case-mortality seldom exceeds 2 per cent., save in children's hospitals, where the case-mortality has reached 13 per cent.[2] in certain outbreaks. In England and Wales the deaths at all ages from rheumatic fever and chorea together formed only 0·34 per cent. of the total deaths alike in 1927 and in 1928, whilst for ages under 15 they account for 0·8 per cent. of all deaths (or 0·7 rheumatic fever alone). If, however, we look only at that interesting period of life between 10 and 15 years, the age of adolescence, and the age at which the acute rheumatic infection is most fatal, we see a different picture. In this age-group acute rheumatism causes 5·4 per cent. of all deaths, and heart disease (80 per cent. of which at this period is due to rheumatic carditis) 10·8 per cent., or together 16·2 per cent., four-fifths as much as all forms of tuberculosis (20·7 per cent.) and more than twice as many as measles, scarlet fever, and diphtheria together (7·1 per cent.).

Fig. 1 shows the cheering fact, well known but somewhat unappreciated, that the mortality figures for rheumatic fever for England and Wales have shown a steady fall in the crude death-rate (persons) per million living from 67 in 1901 to 38 in 1928, which is the lowest on record. Allowing for the change of classification in the Registrar-General's returns in 1881 when acute rheumatism was first separately returned, the mean death-rate for the period 1851 to 1892 may be taken as somewhere in the neighbourhood of 87. Sir Arthur Newsholme[1] in his Milroy Lectures of 1895 noted that the curve of its prevalence as judged by hospital admissions formed "an elevated plateau with undulations from 1868 to 1874 then a sloping declivity, also with minor undulations, from 1874 to 1889." But from 1889 to 1895 there was a somewhat steady rise and from it Sir Arthur surmised that since 1889 "the upward gradient of a second similar wave" of prevalence had commenced. We are now able to see, however, from mortality, hospital, and morbidity statistics alike that, although minor undulations have continued, both incidence and virulence have continued steadily to decline. Moreover, the mortality from heart disease in every age-group in which rheumatic heart disease is the main factor shows considerable reduction, thus supporting the other evidence that acute rheumatism is declining in frequency and virulence. For all ages under 65 the rates for each sex in 1927 are less than those in the decade 1911-20, and in the younger ages under 35 as much as one-third less. It is only in the rates for ages over 65 that the increase in heart disease mortality is seen, but so large is this increase (mainly due to an increased specification of myocardial degeneration[3] (over 75) in death certificates) that it causes the heart mortality-rate for all ages to show increase, in spite of the decrease in the younger ages.

FIG. 1.

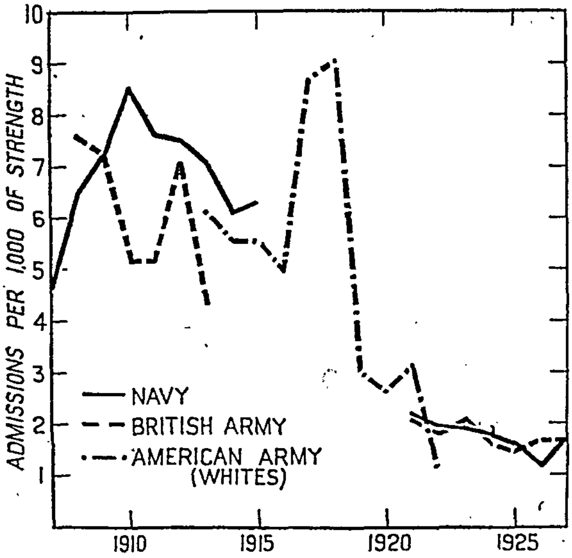


Rheumatic fever crude death-rates, per million living persons, in England and Wales (continuous and interrupted lines), and in the United States registration area (dotted line). The English figure for 1851 to 1892 is an estimated average. The American figures are those given by R. M. Atwater.

In Fig. 1, as I have said, the descent from 67 per million in 1901 to 38 in 1928 (43 per cent. in 27 years) will be seen, and, although epidemic peaks occur in 1901, 1906, 1914, and a sharp one (that described by Dr. Poynton[2]) in 1920, it will be noted that each epidemic peak is lower than the preceding peak. The dotted line shows a similar decline in the *rheumatic fever* death-rate[4] in the United States registration area—a decline at first sight even more striking, for it is from 95 per million in 1901 to 30 in 1923, but in which, although the decline is a real one, there are, as Atwater points out, some unreal factors not present in the English decline. These factors are due to two changes in classification and to the inclusion of certain Southern States with low rates, but even if they account at a liberal estimate for, say, one-third of the apparent fall, the real fall must be substantial.

Galabin[5] and Longstaff,[6] and more recently Atwater,[4] have shown that the trend and the oscillations of the mortality from rheumatic fever show striking statistical analogies with those of scarlet fever, erysipelas, septicæmia, and puerperal fever, resemblances in epidemic incidence extending over 75 years. "Certain years," says Atwater, "prove good years for all, as though the diseases were crops affected by the same influences, while other years prove poor years. Acute rheumatic fever appears to be related to the family of streptococcal infections, because of bacteriological indications, clinical resemblances, and epidemiological kinships."

FIG. 2.



Admission to hospital for rheumatic fever in the Regular Services. British figures are not available for the period of the late war.

NOTIFICATION.

Compulsory notification of cases is still almost confined to Norway (towns only with an aggregate population of about 800,000), Denmark, and Iceland.

The Norway returns show (*a*) a remarkably constant annual attack-rate of 1·5 per 1000; (*b*) a low case-mortality ratio of 0·87 per cent. seven years average, or 0·5 in 1927; (*c*) a characteristic seasonal incidence with a well-marked summer minimum usually in July, and a winter maximum; and (*d*) a striking correspondence with tonsillitis which is also notifiable. This correspondence between tonsillitis and acute rheumatism in seasonal incidence is also seen in English and American statistics.

The Denmark notification figures show a decline of more than 50 per cent. since the nineties, for, whereas the average for the 24 years 1870–93 was 2·18 (Newsholme[1]), during the last five years it has been just over 1 per 1000, and shows little variation. There is some correspondence with the tonsillitis curve as in Norway, but there is less rheumatic fever in proportion to the tonsillitis notified.

Rheumatic fever in Iceland is of a mild and unusual character, with an average attack-rate of 1·25 per 1000 per annum. The incidence seldom runs parallel with that of acute tonsillitis, and the disease is seldom followed by endocarditis. In 1926, for example, of 146 cases notified from a population of 100,117, not one was notified as having cardiac complications.[7] In Iceland, salicylates seem to have but a slight effect upon the disease, and it is suggested that some of the cases notified as rheumatic fever may really be of tuberculous origin (Poncet's form of rheumatoid arthritis). The incidence is three times as great on females as on males, a proportion which certainly suggests a good deal of rheumatoid arthritis, and contrasts strongly with Norwegian experience, where the notifications are equally divided between the sexes. Thus, in ten years (1913–22) in Oslo[8] there were 828 cases of rheumatic fever in males and 815 in females.

In England an experiment in compulsory notification of acute rheumatism in children is in progress in three metropolitan boroughs—Paddington, Kensington, and Holborn, but it is too soon to judge whether the success of these limited trials of compulsory notification will justify a more extended experiment.

EXPERIENCE IN THE SERVICES.

The *Health Reports of the Services* furnish some useful statistics.

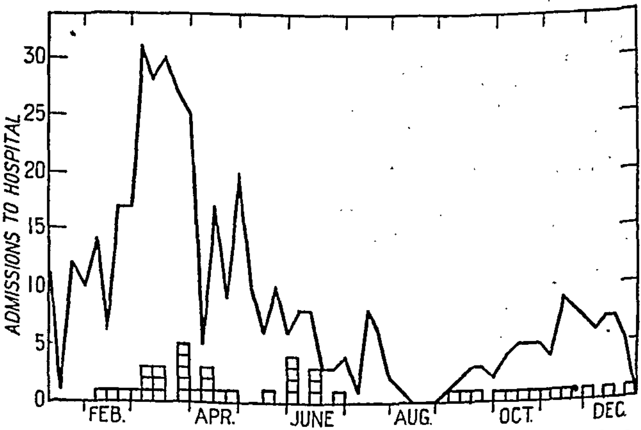
The Army admission-rate has dropped 60 per cent., from 4·3 per thousand in 1913 to 1·7 in 1927, whilst for the Home Army an attack-rate of 5 in 1913 has fallen to 1·9 in the same period. The attack-rate for young insured males (16–24) in the Ministry's inquiry was 1·5 per 1000, a very similar rate. The Royal Navy admission-rate has dropped 78 per cent., from 7 per thousand in 1913 (when "rheumatic fever" was first separately returned from "rheumatism") to 1·7 in 1927, whilst the Royal Air Force admission-rate in 1927 was 0·9. More exact diagnosis may have had some influence in these Service reductions.

The American Army[9] attack-rate shows a very similar reduction of 82 per cent., from 6·2 per thousand in 1913 to 1·1 in 1922, that is for white regular soldiers only, stationed in the Home Country. The admission-rate for negro regular soldiers in the Home Country has only fallen 29 per cent., from 4·1 in 1913 to 3·1 in 1922.

Fig. 2 shows the fall in the attack-rate for the British Army and Navy after the war, and upon it I have inserted a curve showing the incidence for white regular soldiers in the American Army at home. This American curve, although it applies only to regulars serving at home, shows the considerable increase during the two years (1917 and 1918) of intensive mobilisation in the United States, an increase no doubt due to the conditions of overcrowding and new entry consequent upon the sudden creation of a great army.

Surgeon-Captain T. B. Shaw[10] has shown that the reduction in the admission-rate for acute rheumatism in the Navy has not been accompanied by a corresponding decrease in the admission-rates for tonsillitis, which has only fallen from 46 per thousand in 1923 to 36 in 1927, whilst the rheumatic fever rate has fallen from 4·7 to 1·7. In the Army, the tonsillitis rate appears actually to have risen, so that, whereas in 1913 one case of acute rheumatism was admitted to hospital for about every five of tonsillitis, in

FIG. 3.



Epidemic of acute rheumatism at Halton, 1928, shown by admissions to hospital each week. The columns represent acute rheumatism cases, and the line represents cases of tonsillitis and nasopharyngitis. Note that the crest of the tonsillitis wave precedes the crest of the acute rheumatism wave by some three weeks. Total population 3530, of whom 2441 were boys 16–18 years; among these the acute rheumatism attack-rate was 14·3 per 1000.

1926 and 1927 20 cases of tonsillitis were admitted for every case of acute rheumatism. Here again fashion in diagnosis, such, for example, as a transference to tonsillitis of some conditions previously diagnosed P.U.O. may have had some effect.

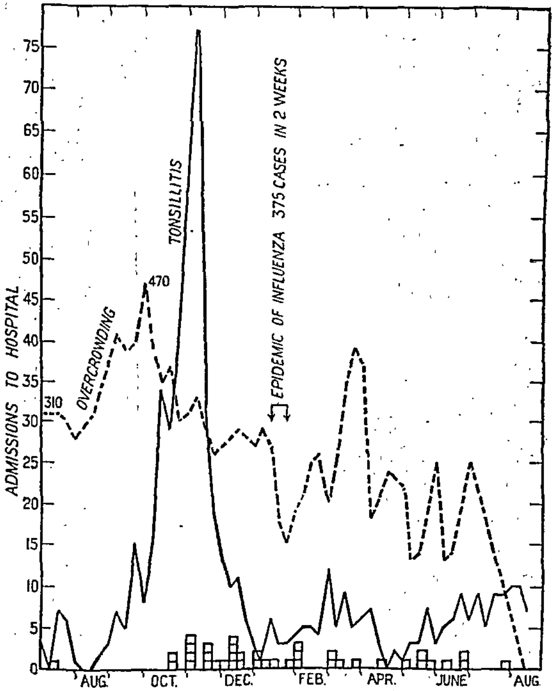
The improved conditions of hygiene in the Services is apparently bringing them into a condition similar to that of our great public schools, in which epidemics of tonsillitis still occur not infrequently but without acute rheumatism. Nevertheless, acute rheumatism still sometimes occurs in epidemic form in the Services. Grenet[11] in 1920 reported five distinct epidemics in the French Army and gave evidence of bed-to-bed infection. The annual report on the health of the Navy has shown high attack-rates at some of the Royal Naval Training Establishments, such as those at Shotley, 14·9 per 1000 in 1925, 13·6 in 1926, and 22·5 in 1927, and shows how closely the attack-rate is correlated with pressure on accommodation.

Dudley[12] has shown the similarity of the incidence of pneumonia and acute rheumatism at Shotley, and the fact that overcrowding and rapid rate of change of population are contributory causes. He considered, however, that damp and chill are a much more important factor than overcrowding in the incidence of rheumatic infections. Dudley[13] also describes the conditions at the training establishment *Impregnable* in 1912–13. He shows that the boys all entered at 15½ years for nine months' training, so that the population was entirely changed during that period. They were housed in three old wooden battleships, one reserved for new entrants. The sleeping accommodation was between decks, on which there was almost no break in the continuity of air space. The hammocks were 16 inches apart, many close to the deck above. All these conditions were peculiarly favourable for droplet infection, whilst the continual influx of new individuals prevented any lasting rise in herd immunity to a specific infection. The annual attack-rates per 1000 were 397 for tonsillitis and 43·7 for rheumatic fever, pneumonia being 35·3. Incidence was heaviest on newcomers.

Other factors are fully discussed by Dudley, and the whole story, now happily ended by the transference of the boys in 1923 to barracks ashore, supports the theory that acute rheumatism is a specific infectious disease of low-grade infectivity conveyed by droplet infection.

An interesting epidemic of acute rheumatism is referred to in the Report on the Health of the Royal Air Force for 1928. At the training establishment at Halton, out of a total strength of 3530, 2441 were aircraft apprentices, who train there for two years all picked boys of a superior class, between the ages of 16 and 18, housed in dormitories, each of which contained 21 beds, in modern buildings. Beginning in February, 1928, there was a sharp epidemic of tonsillitis, 427 cases (175 per 1000) being admitted to hospital. Forty-one cases of acute rheumatism occurred, in 17 (41 per cent.) of which carditis was observed; all but 6 of the 41 patients being aircraft apprentices. By the kind permission of the Director of Medical Services, R.A.F., I have been able to chart the weekly admissions for acute rheumatism and for tonsillitis. Fig. 3 shows that the peak of the tonsillitis epidemic precedes by some two to three weeks the crest of the acute rheumatism epidemic.

FIG. 4.



Epidemic of acute rheumatism, 1926–27. The columns represent admissions to hospital for acute rheumatism (1 square = 1 case). The continuous line shows the admissions for tonsillitis. The interrupted line shows the curve of overcrowding. (Base line = authorised complement. Scale = ten times that for admissions to hospital.) Population about 2000 boys, all 16 years of age. Note that the overcrowding crest precedes the tonsillitis crest, which in turn precedes the crest of the acute rheumatism curve.

AN INSTRUCTIVE OUTBREAK.

Leaving now the Royal Air Force, Fig. 4 illustrates an epidemic in the winter of 1926–27 which occurred in a community consisting of some 2000 boys, all entering at 16 years of age, after a strict medical examination, to undergo a nine months' course of strenuous training. There was a rapid and continuous flow of new entrants. The boys slept in long dormitories, mostly designed to accommodate 42 boys. At the period shown there was definite overcrowding, and there had previously been a good deal of acute rheumatism in the establishment. There were thus present all the factors for a droplet infection, when the season of epidemic prevalence should come round, a community of susceptible age, rendered the more susceptible by sudden transference from home conditions to a strenuous régime, a rapid continuous influx of new entrants, sleeping quarters each containing many boys, and somewhat overcrowded, thus facilitating that massive dosage and rapid transference of infection from person to person which seem to exalt the virulence of droplet infections, and lastly some convalescents or carriers remaining to carry over the infection from the last epidemic season. The epidemic season of late autumn being come, some three weeks after the most severe overcrowding, the epidemic potential, which had gradually developed, reached a critical value, and there was a sharp epidemic of tonsillitis, followed by an outbreak of acute rheumatism. Again we see the peak of the tonsillitis epidemic precedes the crest of the rheumatism wave by some two or three weeks. But it will be noted particularly that the crest of the overcrowding precedes the peak of the tonsillitis also by some two or three weeks. Cases continued for some time, dying down in July, and breaking out again in the next epidemic season.

PARALLELISM WITH CEREBRO-SPINAL FEVER.

These two diagrams (Figs. 3 and 4) strongly suggest that acute rheumatism is a specific infectious disease conveyed by droplet infection, and that it resembles cerebro-spinal fever in its epidemic incidence on a largely *immune population*. We may compare with them Fig. 5, a diagram of a cerebro-spinal meningitis epidemic[14] which occurred in a slightly older community of young recruits undergoing three months intensive training at the Guards' Depôt, Caterham, during the war. It will be seen how like to the tonsillitis curve is the "warning rise" in the carrier rate of the meningococcus which follows overcrowding, and how when the "carrier rate" passes the "danger line" of somewhere about 20 per cent.—in other words, when the "carrier epidemic" reaches a certain intensity—the "case epidemic" begins, and cases of cerebro-spinal meningitis occur. The meningococcus when "carried" does not usually produce either catarrh or tonsillitis, and the "warning rise" can only be demonstrated by regular bacteriological sampling on a large scale.

In the case of the two acute rheumatism epidemics, the "unseen" healthy carrier wave is probably present too, but in addition there are two "visible" waves, the larger the tonsillitis wave, and the smaller the acute rheumatism wave. But if this analogy be true, why did not outbreaks of rheumatic fever occur at Caterham Depôt alongside those of cerebro-spinal fever in January, 1917, and again in May, 1918, when overcrowding was so severe, new entrants so numerous, and conditions so surely favourable? This question came to me with such force that I obtained the kind permission of the War Office and the Ministry of Pensions to examine the records of Caterham Military Hospital, now in the custody of the latter. The cases of rheumatic fever did occur, at the same time, and in almost the same numbers as the cases of cerebro-spinal fever, as Fig. 5 shows. In the winter epidemic of 1917 there were 20 cases of cerebro-spinal fever and 21 cases of rheumatic fever,* but the latter attracted no such attention as was accorded to the cases of the dreaded and fatal "spotted fever," and though admirably treated clinically, were lost sight of epidemiologically.

The chart is especially valuable in that it shows that the occurrence of the cases of rheumatic fever was not due to seasonal prevalence, for during the next winter season, when the depôt had been rigorously "spaced out" as regards its beds, when there was no overcrowding, and ventilation had been improved in accordance with a scheme of prophylaxis against cerebro-spinal fever, not only did the meningococcus carrier rate fall almost to nil, not only were there no cases of cerebro-spinal fever, but also, with the exception of one case in November, there were no cases of acute rheumatism.

In April, 1918, however, came the German Advance, followed by the great "call up," and in May the depôt was more severely overcrowded than ever before. The meningococcus carrier rate shot up, five cases of cerebro-spinal fever occurred, followed by three cases of rheumatic fever. Fortunately, prompt action was taken as a result of the warning rise of the carrier rate, and the overcrowding was abated by the use of tents, and no doubt owing to this action, fine weather, and the fact that the epidemic season for both diseases was now past, no further cases occurred. The correlation between the overcrowding and the incidence of both diseases is very close. I do not suggest, of course, that there was any other connexion between the two diseases than that both as droplet infections reacted similarly to the same causes. The strain of new conditions seems to have been a highly important factor in producing susceptibility, for in all these epidemics the patients were not debilitated or "pre-rheumatic" children, but boys and men selected by recent medical examination as especially robust. No doubt these epidemics might be interpreted in different ways—as Prof. Major Greenwood has said of other epidemics: "They return to our serene questionings a great variety of answers, and we generally catch the answer that we wish to hear"—but to my mind the answer in these cases is clear, that acute rheumatism has been spread by droplet infection, and that its incidence was directly correlated with overcrowding.

The recent work of Cecil, Nichols and Stainby,[15] Carey Coombs,[16] and others seems to prove that acute rheumatism, like cerebro-spinal fever, is a bacteræmia at least in its early stages. Each disease thus seems to have a nasopharyngeal stage, a bacteræmial stage, and a stage where the organism reaches its characteristic locus, in the case of the meningococcus the cerebro-spinal fluid, in rheumatism the joints and heart.

DIRECT DROPLET INFECTION.

The theory that acute rheumatism is conveyed by droplet infection is further supported by its intimate association with tonsillitis and by its strong epidemiological likeness to scarlet fever, as has been seen in mortality statistics. Newsholme[1] gives an interesting summary of observations suggesting the infectivity of rheumatic fever, but concludes that direct infection *if it occurs is exceptional.*

Even in our great public schools, where acute rheumatism is now almost unknown, there is sometimes evidence to be obtained of direct droplet infection. Thus, a large boarding school for girls of the well-to-do class had been free from the disease for many years, when three cases occurred in the same term, and the same house. A boys' public school had three cases in one term, two in the same dormitory; there was a precedent epidemic of tonsillitis, and a too great proximity of beds. My impression is that such small outbreaks sometimes occur in institutions without investigation, and I should be very glad to hear of any instances.

The infectivity of acute rheumatism resembles that of pneumonia or cerebro-spinal fever, and just as the latter in non-epidemic times only occurs in sporadic cases in the most susceptible individuals, so acute rheumatism usually occurs sporadically in susceptible individuals. Thus the possibility of the transmission of acute rheumatism by droplet infection has been lost sight of, even after St. Lawrence showed in his study of the "Family Association of Rheumatism," that in families having one member the subject of the disease, rheumatic infection exceeds tuberculosis alike in family incidence and in frequency among exposed persons. St. Lawrence[17] found that in his 100 rheumatic families the percentage of cases among exposed persons who might have been infected from the patient was 14·8 per cent. in rheumatic infection, whilst the corresponding figure with 100 families in the case of tuberculosis was 14·6 per cent. The corresponding percentage in the Medical Research Council Committee's Report for rheumatic infection was 15. The Committee[18] express the guarded view that, on the whole, while it cannot be said that there is, in the facts collected, any conclusive evidence of contagion, many of them are consistent with this view.

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* Three cases of recurrence of previous acute rheumatism in old N.C.O.'s (each of whom had two recurrences) are omitted.

The theory of droplet infection in rheumatism does not in fact seem to have received much favour from English physicians. Dr. Reginald Miller,[19] who has done a great work for the rheumatic child in this country, for example, says that "there is no such tradition on the side of clinical medicine" as the theory of possible contagion in acute rheumatism, and again, "rheumatism is not a contagious disease." In their admirable recent work M. Campbell and E. C. Warner[20] show that 58 per cent. of rheumatic children have immediate relatives suffering from acute rheumatism, compared with 24 per cent. of non-rheumatic children of the same poor hospital out-patient type, and that while it is rare for a non-rheumatic child to give a history of more than one relative with rheumatism, it is extremely common for rheumatic children to do so. They quote families where all four children are rheumatic and where three out of four children are rheumatic. And yet all this is ascribed to heredity; familial infection is not discussed or even mentioned. So that while other views, heredity, damp housing, deficiency in diet, all no doubt important causal factors, have received great attention in this country, the teaching of St. Lawrence has been somewhat discounted.

> "Thus," says Dudley, "acute rheumatism, and to a less extent pneumonia are interesting examples of how the infective nature of a clinical syndrome may be masked, if a definite environmental complex is essential before a parasite can call forth that special set of reactions of the host which has been dignified with a special name."

In the hope that the importance of droplet infection in acute rheumatism will receive greater attention, I have therefore emphasised these epidemics at the cost of omitting many better-known aspects of the incidence. The theory of droplet infection, far from denying the influence of heredity, defective diet, damp housing, or poverty upon the incidence of acute rheumatism, helps us to understand the nature of their influence. The incidence is determined by two sets of factors. The first cause massive dosage and include overcrowding, close contact, as by sleeping in the same bed, defective ventilation and catarrhal diseases increasing the infectors spraying capacity. The second set of factors are those which lower the immunity of the individual and of the herd, those affecting the individual including rheumatic heredity, new entry to the infected community, defective diet, especially the lack of vitamin A, dampness† of house or site, chill, fatigue and antecedent diseases, that affecting the community a rapid influx of new entrants. Poverty, especially in urban conditions, is the parent of nearly all these factors, and so acute rheumatism is a disease of poverty and of towns.

THE SOCIAL INCIDENCE.

No disease has a clearer cut "social incidence" than acute rheumatism, which falls perhaps thirty times as frequently upon the poorer children of the industrial town, as upon the children of the well-to-do. This subject has been fully discussed in the recent report[18] of the Child Life Committee of the Medical Research Council. I agree, however, with those who hold that the incidence of acute rheumatism increases directly with poverty, malnutrition, overcrowding, and bad housing. I do not agree with those who hold that the incidence is greater in the artisan class or in those just above the poverty line than in the classes below that line. The high incidence of acute rheumatism shown in Fig. 6 (adapted from G. Danieschewski[22]) in the city of Moscow may be in part due to poverty, deficient diet, and overcrowding. Danieschewski finds a still higher incidence in the agricultural districts around Moscow.

Heredity is an important factor but familial infection is at least as important; examination and supervision of familial contacts appears desirable.

> "A review," says Atwater,[4] "of the epidemiology of acute rheumatic fever indicates from many angles that this disease is one of the communicable infections caused by a living parasite which gains access to the body from without, and which produces a disease picture in which the age, sex, seasonal, racial, and other characteristics are fixed, and being close in their resemblance to the well-known epidemic diseases. Taken with the recently confirmed evidence of multiple cases in rheumatic families, we may well agree with Hirsch that rheumatic fever deserves an assured place among the active infective diseases."

In a large proportion, perhaps 70 per cent., of cases,

FIG. 5.

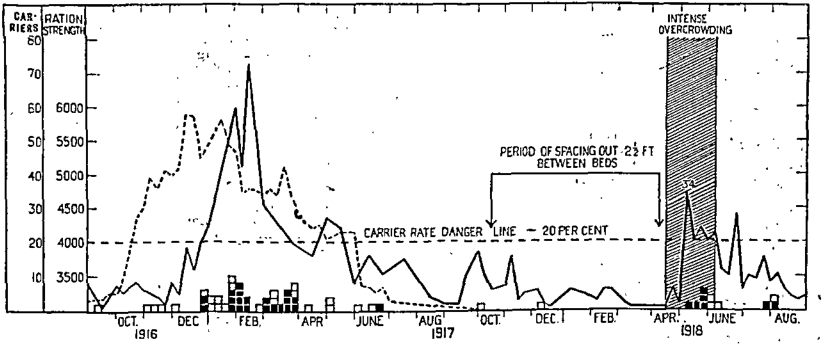

Diagram showing the effect of overcrowding in producing (1) cerebro-spinal fever (each case = 1 black square), and (2) rheumatic fever (each case = 1 white square). The continuous line represents the percentage carrier-rate of the meningococcus (each line = 2 per cent.). The dotted curve represents the ration strength. When this passes 4600 the overcrowding is severe; when it passes 5000 the overcrowding becomes extreme. As this happens the meningococcus carrier-rate rises and when the latter passes the danger line of 20 per cent. cases of cerebro-spinal fever occur. Cases of rheumatic fever occur at the same time and in almost equal number, suggesting that a similar process is at work. The shaded area shows a short period of intense overcrowding following the great call up of April, 1918. It is cut short by special measures. "Spacing out" (i.e., increasing the distance between beds to 2½ ft. and improving ventilation) from October to April, produces almost complete cessation of cases of both diseases, even in their epidemic season, and the carrier-rate falls to nil.

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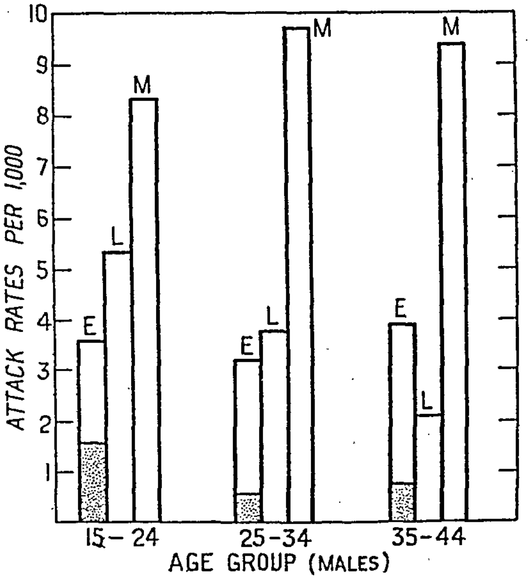
† Compton has shown how a damp atmosphere may facilitate droplet infection.

once the infection has taken place, acute rheumatism assumes the form of a *chronic infection*, which may have long periods of latency, alternating with periods of activity and advance.

STATISTICS FROM HOSPITAL.

Statistics based on hospital admissions for acute rheumatism confirm the impression of a declining incidence, for the proportion of admissions of patients with acute rheumatism to the proportion of all medical in-patients has been steadily diminishing since about 1895. Ormerod,[23] in 1852, stated that 11·2 per cent. of all admissions to London hospitals were on account of rheumatic fever. Miller,[24] taking quinquennial periods from 1869–1914, from the St. Bartholomew's Hospital Reports, showed that the proportion of acute rheumatic cases to all medical in-patients had dropped from about 10 to about 5 per cent., the percentage of acute rheumatic patients who developed pericarditis had also fallen. Since the war the diminution in London has been rapid.

FIG. 6.



Attack-rate of acute rheumatism for various age-groups in England during 1922 (E), in Leipzig[22] 1887–1907 (L), and in Moscow during 1928 (M). The stippled areas in the English columns represent "acute" as opposed to "subacute" cases. Moscow age-groups are 15–19, 20–29, 30–39.

Dr. A. A. Osman and Dr. H. G. Close have kindly put at my disposal the figures for Guy's Hospital and Lambeth Infirmary, which show (Fig. 7) that the annual admissions for acute rheumatism at Guy's Hospital during the five years 1910–14 averaged 148, the average number of medical in-patients per year being 2746, a percentage of 5·4, nearly identical, that is, with the St. Bartholomew's figures for 1914. For the six years 1921–26 the average number of admissions is 26 on an average total number of medical in-patients of 2266, a percentage of only 1·1, one-fifth that is of the previous proportion.

At the Lambeth Infirmary for the four years 1911–15 acute rheumatism furnished 1 per cent. of the total number, whilst for the six years 1922–27 the proportion was only 0·45 of the total number of admissions. The Royal Free Hospital in 1928 admitted 1·47 per cent. of all in-patients on account of acute rheumatism. The late Dr. Wheatley, of Shropshire, pointed out that at Blackburn Infirmary in the years 1888, 1889, and 1890, no less than 100 cases of rheumatic fever, mostly of a severe type, were admitted, whereas during 1920, 1921, and 1922, only 11 cases were admitted.

In America, Lambert,[25] at Belle Vue Hospital, New York, in 1920, found that there had been a striking diminution, especially marked in persons between the ages of 20 and 29, although the number of admissions in the 5 to 9 group had increased, whilst the 10 to 14 group was practically stationary, and the 15–19 group had decreased slightly, but not in proportion to the diminution for all ages. D. and B. C. Seegal[26] have studied hospital admissions in the United States and Canada, and point out that the average annual frequency has diminished, though not uniformly, for in 1924 and 1925 certain hospitals, such as the Presbyterian Hospital, New York, and the Johns Hopkins Hospital, Baltimore, showed an increased rate of rheumatic fever admissions. The disease, however, now seems more typical, severe, and frequent in the North Eastern States and in Canada than in this country. Dr. C. P. Howard,[27] of Montreal, says: "The picture of rheumatic fever that we see in Montreal impresses one with the frequency and severity of the disease. In the Montreal General Hospital of 5000 patients admitted to the wards, 226 (4·5 per cent.) had rheumatic fever. Both sexes suffer equally, and the age of greatest incidence comprises the second, third, and fourth decades." This was the state of things in London 35 or 40 years ago.

Children's hospitals in London naturally show a higher ratio of admissions. Gordon Pugh[28] in 1925 found in six London children's hospitals 377 in-patients out of 10,096 suffered from acute rheumatism or its effects—3·7 per cent. Ninety-nine only of the 377 were cases of rheumatic fever, 117 were cases of carditis, and 161 had chorea.

AN OBSOLESCENT DISEASE?

Our review of the incidence of acute rheumatism seems to show that it, like tuberculosis, is slowly but surely being conquered. But the analogy with scarlet fever must make us cautious lest another wave of increased virulence (such as that culminating in 1875 in scarlet fever) occur in acute rheumatism, and so falsify our optimism. We seem, however, to be seeing the same process of epidemiological obsolescence in acute rheumatism that Creighton saw in small-pox. "It would," he said, "be a not incorrect summary of the incidence of small-pox in Britain to say that it first left the richer classes, then it left the villages, then it left the provincial towns to centre itself in the capital; at the same time it was leaving the age of infancy and childhood. Of course, it did none of these things absolutely."

Acute rheumatism seems to be following this course, but it certainly has not yet left the age of childhood. But whilst we appreciate this cheering decline in the incidence of rheumatic fever, we are still painfully aware of the high incidence in children of the major or minor stigmata of the acute rheumatic infection, and of those many patients who, in what should be their happy youth or vigorous manhood perish slowly of rheumatic heart disease.

The triumph over acute rheumatism, of which this decline is but the herald, is yet afar off. It must but spur us to further effort, first to prevent as far as possible the infection of children, secondly to supervise those who may have been infected, thirdly to provide institutional treatment suitable for those seriously infected to ensure them the fairest chance of recovering from their carditis without permanent damage to the heart.

First, can infection be prevented? Every slum destroyed, every overcrowded tenement cleared, every unhygienic school building improved, every playing field provided, is a step forward. Education of parents and children as to nurture, diet, and fresh air are of great importance, and every improvement in food, wages, hours of work, and sobriety helps to raise the resistance of the child of the industrial town against the infection of acute rheumatism.

The school medical service has already accomplished great things; the children are hardly recognisable as the same class so much have they altered for the better in the 21 years since I was a school doctor in public elementary schools. For the supervision of those who may be infected, in large towns the rheumatism supervisory centre appears indispensable; it does best when attached to a children's hospital, the officer in charge should be a physician of consultant standing, used to children, and of winning personality. London now has 11 of these centres. As regards institutional treatment, I here should like to pay tribute to the pioneer work of the Invalid Children's Aid Association in providing London with the first two residential schools specially for children convalescent from rheumatic heart disease. When in this coming autumn the Metropolitan Asylums Board add to the 170 beds they already provide for rheumatic children the new accommodation of 350 beds they are adding for this purpose to Queen Mary's Hospital, Carshalton, London will have a provision of this special accommodation equal to that of any city in the world.

FIG. 7.

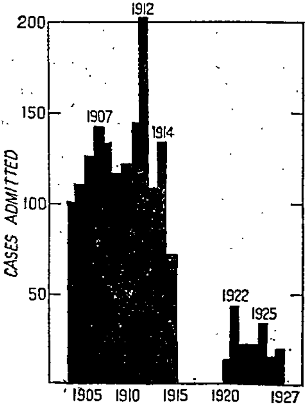


Diagram showing cases of acute rheumatism (actual numbers) admitted to Guy's Hospital in the years 1905–15 and 1920–27. (Drs. Osman and Close.)

If in this lecture I have omitted many aspects of the incidence, it is because my first task seemed to be to restate the incidence of acute rheumatism (notwithstanding its low infectivity) as the incidence of a specific infectious disease conveyed by droplet infection.

REFERENCES.

1. Newsholme, A.: THE LANCET, 1895, i., 589.
2. Poynton, F. J.: Brit. Med. Jour., 1920, ii., 858.
3. Registrar-General's Statistical Review, 1927, Text Table, xlvii. p. 74.
4. Atwater, R. M.: Amer. Jour. Hyg., 1927, vii., 344.
5. Galabin, A. L.: THE LANCET, 1902, i., 1671.
6. Longstaff, G. B.: Trans. Epidem. Soc., 1904–05, p. 33.
7. See THE LANCET, 1929, ii., 748.
8. Tanberg, A.: Norsk. Mag. f. Laegovidenskaben, February, 1925, p. 139. See Brit. Med. Jour., 1925, i. (Epit. Med. Lit., p. 65).
9. Faulkner, J. M., and White, P. D.: Jour. Amer. Med. Assoc., 1924, lxxxiii., 426.
10. Shaw, T. B.: Proc. Roy. Soc. Med., Dec. 28th, 1924.
11. Grenet, H.: Gaz. des Hôp., 1920, xciii., 5.
12. Dudley, S. F.: Med. Res. Counc. Spec. Rep. No. 111, p. 55.
13. „ : Ibid., No. 111, p. 37.
14. Glover, J. A.: Ibid., No. 50, p. 150.
15. Cecil, R. L., Nicholls, E. E., and Stainsby, W. J.: Jour. Exp. Med., 1929, l.
16. Coombs, C. F.: Brit. Med. Jour., February 8th, p. 227.
17. St. Lawrence, W.: J. Amer. Med. Assoc., 1922, lxxix., 2051.
18. Med. Res. Counc. Spec. Rep. No. 114, p. 98.
19. Miller, R.: Brit. Med. Jour., 1927, i., 958.
20. Campbell, M., Warner, E. C.: THE LANCET, Jan. 11th, p. 61.
21. Compton, A.: Compt. rend., 1915, clx., 472; THE LANCET, 1917, ii., 14.
22. Danieschewski, G.: "Akuter and Chronischer Rheumatismus in de Ud SSR," 1929, table 3, p. 15.
23. Ormerod, G.: Med. Times and Gaz., 1852, p. 523.
24. Miller, R.: Brit. Med. Jour., 1923, ii., 702.
25. Lambert, A.: Jour. Amer. Med. Assoc., 1920, lxxiv., 993.
26. Seegal, D., and B. C.: Ibid., 1927, lxxxix., 11.
27. Howard, C. P.: Ibid., 1928, xci., 48.
28. Pugh, W. T. G.: Ann. Rep. Metrop. Asyl. Board, 1925, p. 341.
29. Statistics, Federation of Sick Societies, Leipzig, 1910.

THE QUALITATIVE SERUM DIAGNOSIS OF ENTERIC FEVERS.

DIRECTIONS FOR ITS PERFORMANCE.

BY A. FELIX, D.SC. VIENNA.

(From the Bacteriological Department, Lister Institute, London.)

IN a recent editorial article in THE LANCET[1] the reasons for failure of the Widal test performed by the customary quantitative method have been discussed, and attention has been drawn to the qualitative method which I have suggested for the serological diagnosis of enteric fevers.[2] This method has been alluded to as "somewhat of a mystery." While this statement does not appear to be justifiable, it must be admitted that the new method is unknown to clinical pathologists, and has—with few exceptions only (Stuart and Krikorian,[3] Gardner,[4] Pijper[5])—not been subjected to a serious critical test. A brief account of this qualitative method, including technical directions for its performance, may, therefore, be of some interest.

The principles of qualitative serum analysis have been derived from the study by Weil and Felix[6] of the antigenic structure of *Bacillus proteus* and the typhoid-paratyphoid group of organisms. These and other flagellated bacteria possess the two kinds of antigen known as the "O" and the "H." The present knowledge of the occurrence of these two kinds of antigen, their immunological significance, and their inter-relationship among the various members of the salmonella group has been given a lucid presentation by Topley and Wilson[7] in their recently published text-book, to which the reader is referred.

The qualitative method of diagnosing enteric fevers is based on the distinction of "O" and "H" agglutinins in the patient's serum. For the sake of simplicity, typhoid and paratyphoid A and B only are dealt with in the following account of the procedure. Infections due to other members of the salmonella group of organisms—e.g., *B. paratyphosus* C, *B. enteritidis Gaertner*, *B. aertrycke*, &c., are excluded here from consideration.

Technique.

The macroscopic technique only is to be applied. For well-equipped laboratories the use of suspensions of living bacteria is still recommended since they give the highest degree of sensitiveness. Where a well-equipped laboratory is not available, properly prepared preserved suspensions should be employed.

(a) *Suspensions of living bacteria.*—Fresh saline suspensions of living bacteria from 24 hours old agar slopes are used. Certain details of the preparation of the agar medium must be strictly observed (see Felix,[2] Stuart and Krikorian[3]).

Although the differentiation between "H" and "O" agglutination can be made with any laboratory strain since their characteristics are sufficiently distinct and constant, still it is recommended to use the following strains, whose known antigenic properties and sensitiveness to "O" agglutinins are of assistance to this differentiation.

"H" 901 =	*B. typhosus*	= "H" variant of strain 901 (Weil and Felix).
"O" 901 =		= "O" variant of strain 901 (Felix and Olitzki).
"H" B2 =	*B. paratyphosus* B	= "H" variant of strain No. 2.
"O" B =	*B. aertrycke* ..	= "O" variant of strain "Glasgow" (Schütze).
"H" A6 =	*B. paratyphosus* A	= "H" variant of strain. No. 6.
"H" A1 =		No. 1.

It will be seen that six cultures are used for the differentiation of "H" and "O" agglutinins in cases of the three most common enteric infections, those due to *B. typhosus* and *B. paratyphosus* A and B.

If one used “O” and “H” variants of these three organisms for the detection of the three pairs of “O” and “H” agglutinins, the “O” variant would serve as reagent for the corresponding “O” agglutinin only, whereas the “H” variant, which reacts to both kinds of antibody, would detect the “H” agglutinin. However, a true permanent “O” variant has up till now only been isolated in the case of *B. typhosus*; an “O” variant of *B. aertrycke*, recently isolated by Schütze,[10] has been selected as the reagent for “O” agglutinins of *B. paratyphosus* B, since these two organisms possess identical “O” antigen; in the case of *B. paratyphosus* A, since a pure “O” variant is still lacking, a strain A1, which is sensitive to “O” agglutinins as well as to “H” must be substituted. Another strain A6, which is equally sensitive to “H” but not to “O” agglutinins, can conveniently be used in addition for comparison.

All these cultures are in the National Collection of Type Cultures. With the exception of the recently isolated “O” variant of *B. aertrycke*, all of them have been used in agglutination tests for many years. The strain *B. typhosus* 901 has constantly retained its remarkable sensitiveness to “O” agglutinins for a period of 12 years.

Both the “H” and “O” variants should be tested from time to time with appropriate rabbit immune sera in order to ascertain whether their respective antigenic properties have been maintained. Such controls are essential since $H \rightleftarrows O$ variation is reversible. Especial attention must also be paid to the smooth-rough variation of the cultures used (Arkwright[8]); saline controls of all bacterial suspensions with solutions of 3·4 per cent. and 6·8 per cent. NaCl should therefore be added to the customary control with normal saline. Andrewes's group-type phases, concerning the “H” antigen of *B. paratyphosus* B, cannot be discussed here.

Two dilutions of the patient's serum—viz., 1 in 100 and 1 in 200, are tested with each suspension; the second dilution is included only as a safeguard against the chance error inherent in a single tube method. Titration to the titre limit is unnecessary for routine diagnosis, with the exception of those cases which have a history of a previous enteric infection (see last section, 3 *c*). However, titration to the end-titre is of assistance in differentiating between “O” and “H” agglutination, until certain initial difficulties in reading the results have been overcome by experience. Moreover, the titre limit of “O” agglutinins has a definite prognostic significance.[2]

The results are read with a lens of about 10 X magnification after incubation for two hours at 37° C., and again after further 16–18 hours at room temperature.

(*b*) *Preserved suspensions.*—(1) Suspensions of “H” variants preserved in the usual way with phenol or formalin are sensitive reagents for “H” agglutinins, but may react also slightly with “O” agglutinins. (2) Alcohol suspensions of both “O” and “H” variants are pure reagents for “O” agglutinins, but not so sensitive as living cultures.

Alcoholic suspensions of the sensitive strain *B. typhosus* 901 have already been prepared by Dr. Gardner[4] (Oxford), who recommends 24 hours incubation at 52° C. for this suspension. It is hoped that separate suspensions for demonstrating “H” agglutinins alone will eventually be available in addition to the alcohol suspensions which are pure reagents for “O” agglutinins. These might be obtained by selecting “H” variants of strains of very low sensitiveness to “O” agglutinins and by increasing the concentration of phenol or formalin until the inhibitive action of these chemicals on “O” agglutination (Felix and Olitzki[9]) completely suppresses the “O” agglutination in these suspensions. Thus preserved suspensions of such high and permanent sensitiveness will be obtained that they can be substituted for the suspensions of living cultures whose inherent disadvantages are well known.

Differentiation of “O” and “H” Agglutination.

“H” Agglutination.	“O” Agglutination.
Forms rapidly.	Forms slowly.
Settles rapidly.	Settles slowly.
Flakes large and of varying size.	Flakes small and uniform.
Sediment voluminous.	Sediment scanty.
Supernatant fluid turbid.	Supernatant fluid clear.
Sediment easily dislodged (becomes similar to saline control on shaking).	Sediment difficult to dislodge (cuticular floating in clear fluid).

The decision as to whether “H” agglutinins are present or not (alone or simultaneously with “O” agglutinins) is in the majority of cases made by reading after two hours. This decision can often be made earlier; repeated inspection of the tubes in the course of the first two hours is therefore advisable. The second reading, after 18 till 20 hours, discloses weak “O” agglutination in those cases in which it was still invisible after two hours.

When suspensions of living bacteria are used, attention must be paid to the fact that the reaction of the “O” agglutinin occurs much more slowly with the “O” variant than with the “H” variant, although the degree of agglutination seen after standing all night is, as a rule, distinctly higher with the “O” than with the “H” variant.

Interpretation of Results.

General remark.—In “H” agglutination even a weak reaction in a serum dilution of 1 : 100, corresponding to + or ± may be considered as “positive.” “H” agglutinins do not occur in human normal serum, certainly not in a dilution of 1 in 100. In “O” agglutination, however, only a strong reaction should be considered as “positive,” since normal agglutinins in human serum are “O” agglutinins, and may even reach a titre of 1 in 100. This is especially the case with the sensitive strain *B. typhosus* 901 (cultures “O” 901 and “H” 901), and only a result 1 in 100 + + + shall be taken as “positive.” Weaker reactions shall be designated as “doubtful.”

1. *In cases not previously inoculated and not giving a history of previous enteric infection.*—(*a*) “H” agglutination with one of the strains used definitely decides the diagnosis. “H” agglutination can occur with the homologous organism only—i.e., that responsible for the infection. (It is pointed out again that cases of infection with *B. paratyphosus* C, *B. aertrycke*, &c., are not here considered.) (*b*) “O” agglutination with one or two or with all strains definitely gives only the diagnosis “enteric group.” The differentiation between typhoid and paratyphoid A and B cannot be reached from “O” agglutination; titration to the end-titre is of no assistance to this differential diagnosis. (*c*) In typhoid fever as well as in paratyphoid A and B infections, “O” agglutination usually occurs earlier with the sensitive cultures “H” 901 and “O” 901 than with the homologous strains. This, together with the fact that “O” agglutinins appear in the patient's serum at an earlier date than “H” agglutinins, renders early serological diagnosis possible.

2. *In the inoculated* (without regard to the time that has elapsed since inoculation).—(*a*) In patients inoculated with the polyvalent TAB. vaccine, “H” agglutination must be entirely disregarded. (*b*) In patients inoculated with monovalent T. vaccine, the “H” agglutination with A or B is as significant as in the uninoculated and “H” agglutination with T. only need be disregarded. (*c*) “O” agglutination with either of the strains gives the diagnosis “enteric group”; further differentiation within the group is not possible by serological examination.

3. *In cases which have a history of previous enteric infection* (without regard to the time that has elapsed since that infection).—(*a*) If the type of the previous infection is precisely known (T.A. or B.), the appearance of “H” agglutinins for another type definitely decides the diagnosis. (*b*) If the type of

the previous infection is unknown, "H" agglutination must be entirely disregarded. (c) Residual "O" agglutinins show significant fluctuation of the titre only in the course of another enteric infection. The appearance of "O" agglutinins or a marked fluctuation of their titre are, therefore, of diagnostic significance, and justify the diagnosis "enteric group." For this particular purpose the "O" agglutinins must be titrated up to the end-titre.

References.

1. THE LANCET, Feb. 1st, p. 248.
2. Felix, A.: Jour. Immun., 1924, ix., 115.
3. Stuart, G., and Krikorian, K. S.: Jour. Hygiene; 1928, xxviii., 105.
4. Gardner, A. D.: Ibid, 1929, xxviii., 376.
5. Pijper, A.: Ibid., 1930, xxix., 380.
6. Weil, E., and Felix, A.: Zeit. f. Immunitätsf., 1920, xxix., 24.
7. Topley, W. W. C., and Wilson, G. S.: Principles of Bacteriology and Immunity, London, 1929.
8. Arkwright, J. A.: Jour. Path. and Bact., 1921, xxiv., 36.
9. Felix, A., and Olitzki, L.: Jour. Hygiene, 1928, xxviii., 55.
10. Schütze, H.: Brit. Jour. Exper. Path., 1930, xi., 34.

TWO PITUITARY TUMOURS.

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THE two cases of pituitary disease which form the subject of the following observations occurred in mental hospital patients, one in 1912 and the other in 1928. Though differing widely in their clinical course and pathology, both cases present unusual and, I venture to state, unique features.

The first case was published in 1913 by the courtesy of Dr. S. Rutherford Macphail, then superintendent of the Derby Borough Mental Hospital. I have to thank Dr. William Reid, superintendent of the Staffordshire Mental Hospital at Burntwood, for his kind permission to use the second case for this paper.

The Cases Described.

CASE 1, a married woman of over 40 years of age, first came under observation in 1908 on account of mental symptoms. At first these consisted of apathy, with loss of memory and emotional reaction. An ophthalmoscopic examination at this time revealed nothing abnormal, and there was no complaint of headache or vomiting; the mental state would not allow a test of the fields of vision. Frequent incontinence of urine and fæces was present, due probably to mental indifference. In December, 1908, she was sent to the Derby County Asylum, and while there the mental apathy became more profound. In April, 1909, she was tried at home again but did not improve and had several fits indistinguishable from ordinary epileptic seizures. All this time she took her food well but remained totally indifferent to everything else, being very somnolent and staying in bed all day. She was readmitted to the Derby County Asylum in October, 1911, and transferred to the Borough Asylum in December. On admission to the Derby Borough Asylum she was a woman aged 48, of middle height, dark complexion, and satisfactory general nutrition; the hands and feet were small and well-formed. Physical examination revealed a mitral presystolic murmur, somewhat myotic pupils with a sluggish light reaction, dull flexor plantar reflexes, ordinary knee-jerks, and no diminution of the pain sense so far as could be made out. The urine, beyond being rather concentrated, showed no abnormal features. The mental condition was one of apathetic dementia with inability to answer any but the very simplest questions, and complete indifference to the passage of the evacuations. She complained of no pain. She resented greatly any attempt to examine the eyes, so that ophthalmoscopy was not possible, but she certainly suffered from marked dimness of vision, as evinced by her manner of eating and going about. This became more pronounced from month to month. On her admission there was no physical sign of paralysis or paresis, and she was able to walk quite well. Her mental symptoms became more accentuated, and in March and April, 1912, she had two fits with bilateral convulsions. About this time weakness of the right hand showed itself and she also had several mild attacks of painless vomiting. On June 1st, 1912, she was noticed to become more drowsy than usual, and in the evening passed into a series of fits, 15 of which succeeded one another without return of consciousness. She remained comatose with very stertorous breathing, and died in the middle of the following day.

Necropsy.—On removing the calvarium, which was markedly increased in thickness and density, especially in the frontal region, the following evidence of extreme cerebral compression was noted: the dura was very tense, the subdural space was practically obliterated, and the superficial convolutions were quite flattened. On removing the brain, an ovoid tumour was seen in the centre of the anterior cranial fossa; it measured 4·5 cm. transversely and 6 cm. anteroposteriorly, and was firmly attached to the sella turcica and less so to the cribriform plate of the ethmoid. The surface was nodular and the consistence firm, the growth being quite circumscribed and only exerting pressure on the adjacent parts. A deep hollow was thus present in the base of the brain, extending from the posterior perforated spot to the frontal pole, and being widest midway between those two points. The floor of the hollow consisted of the flattened convolutions of the mesial and inferior surfaces of the frontal lobes, the encroachment being slightly more extensive on the left side than on the right. The optic chiasma and the olfactory tracts and lobes were not distinguishable. Sections of the hardened brain showed that the cavities of the lateral and third ventricles were almost absent; the brain was otherwise healthy to the naked eye and weighed 41½ oz. The tumour was examined microscopically by the late Dr. W. Ford Robertson and was described as a spindle-celled sarcoma; but I am now inclined to think that it belongs to the endothelioma class; at any rate, there is no doubt that it was a non-malignant connective tissue tumour.

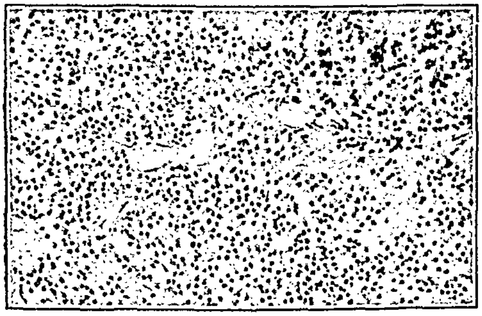
CASE 2, a single female, aged 67 years, was admitted to the Burntwood Mental Hospital on April 25th, 1928. Before admission she had been restless and unreasonable in conduct for several weeks. She was said to have had a fall in the house two years previously and not to have been the same since then. She had been more or less confined to bed for 18 months owing to an affection of the knees. The family history showed that brothers and sisters had died of cancer, tuberculosis, and pneumonia. The causes of her parents' deaths were unknown and no mental disease had been heard of in the family. She was at first sent to the poor-law hospital at West Bromwich, but proved so difficult to manage that she was transferred to the mental hospital: she was confused and restless and gave evidence of visual hallucinations. She was of average nutrition and rather flabby; her height was 5 ft. 1 in., and her weight 9 st. 2 lb. There was no deformity of the hands but severe chronic arthritis of both knees with bony thickening at the margins of the articular surfaces of femora and tibiæ and permanent flexion of both joints; she complained of pain on passive movement of the knees. The skin was clear and not abnormal; the hair was dark. She had no teeth. Her arteries were thickened moderately and her heart's action weak, but there were no signs of valvular disease. The urine showed no abnormalities. The tongue was coated. Nothing abnormal was observed in the nervous system; her vision seemed acute, the pupils were normal, and she was not deaf. There was nothing unusual in the face. She was confused, stupid, and emotional; had no proper appreciation of time or place and had well-marked loss of memory for recent events. Her general conduct was childish and querulous but not unusually restless. In other words, the mental picture was one of senile dementia (cerebral arteriosclerosis), and this was supported by the patient's physical state.

For about four months the mental and bodily condition remained much the same. The only additional facts noted were that she often had incontinence of urine but that the quantity passed always seemed to be normal; she occasionally expressed delusions based on visual hallucinations—e.g., she would complain that strange men visited the ward at night. She took her food well and showed no mental torpor or drowsiness; in fact, she was quite alert in many respects. On the whole she was the kind of case which, were it not for incontinence of urine, would probably have remained in the poor-law hospital. At the beginning of October, 1928, it was practically arranged that she should be nursed at home. On Oct. 16th there was quite a sudden change. She became less alert mentally, with distinct drowsiness and disinclination for food, and had some œdema of the right naso-orbital part of the face. The pupils were normal and no ophthalmoplegia could be made out; owing to her great resistiveness the ophthalmoscope could not be used. Next day the drowsiness and œdema had increased; she had to be spoon-fed with fluids, and had retention of urine. A catheter specimen of urine showed nothing abnormal. The next day the œdema was present on both sides of the bridge of the nose and she was semi-comatose. In the last days of the illness the only definite paralytic sign was paresis of the right lower face on Oct. 19th; by this time she could not speak, but owing to her semi-conscious state, this was not necessarily caused by a focal lesion. The movements of the upper limbs remained normal and there was no change in the lower extremities. The coma increased and swallowing became more and more difficult, and she died on Oct. 21st.

Necropsy.—The contraction of the lower limbs caused by the chronic arthritis was the only external evidence of disease. On opening the cranial cavity evidence of cerebral compression appeared in diminution of the subdural space and cerebro-spinal fluid and some flattening of the lateral convolutions. A tumour in the pituitary region was discovered, resembling a good-sized damson in size and shape, with the long axis transverse; a thin shell of separated bone was to be seen on the posterior part of the upper surface, this evidently being the attenuated posterior wall of the sella turcica. The growth was extremely soft and succulent in consistency, so much so that the violence of chiselling the cranial base caused a fissure in its surface. The cup-shaped depression produced was bounded posteriorly by the anterior aspect of the mesencephalon, the corpora mammillaria being flattened on either side by the mesial aspects of the temporo-sphenoidal lobes and in front by a transverse line passing between the poles of the temporo-sphenoidal lobes in front of the posterior fourth of the gyri recti in the frontal lobes. The growth had passed neither in front of nor behind the optic chiasma but had displaced this structure vertically upwards. The third nerves must also have been stretched by the growth. A sagittal mesial section through the growth and its place of origin does not show any encroachment on the sphenoidal sinus and also demonstrates the absence of the posterior wall of the sella.

The tumour was kindly examined by Dr. W. F. Harvey, histologist at the laboratory of the Royal College of Physicians of Edinburgh. Two photomicrographs were taken (Figs. 1 and 2). The stroma was found to consist of columns of cells arranged in whorls and curves; in some parts supporting trabeculæ of a rudimentary appearance were present, and there were numerous capillary blood-vessels. Nearly all the cells were definitely glandular in type, showing either clear protoplasm or a varying degree of granularity, the granules being refractile in appearance and not having a marked affinity for the acid stain. The nuclei of these cells were large, oval in shape, and contained a very well-marked basophile network. Besides the large glandular cells there were a few lymphocyte-like elements with round, deeply staining nuclei and scanty, clear cytoplasm. No mitotic figures were to be seen, but there were some bizarre types of nuclei which are said [1] to be often seen in rapidly progressing hyperplasias of this kind. No spaces containing colloid material were to be seen. It was concluded that the tumour was an adenoma of the anterior lobe of the pituitary gland. The posterior lobe of the gland was presumably flattened and compressed, but a microscopic section was not made to demonstrate this point.

FIG. 1 (Case 2).



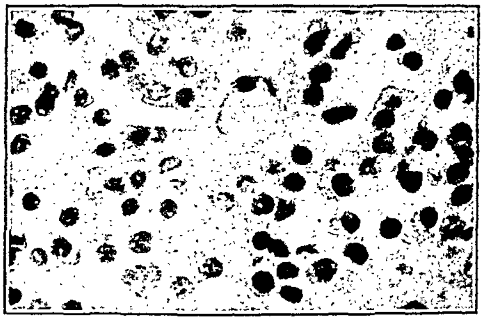
Section of pituitary adenoma (low power).

The brain showed the appearances which would be expected in a case of not very severe senile dementia—viz., some thickening and milkiness of the pia arachnoid over the cerebral convexity, pallor of the cerebral cortex, and marked sclerosis of the intracranial arteries (the thickened basilar artery was conspicuous). The slight increase in the subdural space usual in such cases was not noticeable, perhaps owing to the neoplasm. There was mitral stenosis of moderate degree with some cardiac hypertrophy and moderate chronic venous congestion of the liver and spleen; the suprarenal glands appeared perfectly normal to the naked eye. General arterio-sclerosis with some aortic atheroma was present.

Remarks.

Clinical Course.—There is nothing exceptional in the clinical course of Case 1. The duration and gradual development of the symptoms and signs were similar in character to those of many other intracranial growths. Cushing's Case 8 [2] was very similar in many ways, was described as a most unusual case (infundibular endothelioma), lasted five years, and died after surgical treatment. In Case 2 the course of the illness is remarkable for its extremely short duration. The actual date of commencement of symptoms due to the pituitary growth is difficult to settle owing to the concomitant senile dementia, but pressure effects did not appear until little more than a week before the patient's death, and their character suggested unusually rapid growth. I can find no record of any actual pituitary growth announcing itself with such dramatic suddenness. The patient never even complained of headache (she certainly would have, had it occurred) and showed no drowsiness until about a week before her death.

FIG. 2 (Case 2).



Section of pituitary adenoma (high power).

Pressure effects caused by pituitary growths are variable,[3] but depend on the speed and duration of the growth. Apart from symptoms common to all cerebral tumours, one may note especially bi-temporal headache, sleepiness passing into stupor, and the changes in vision due to pressure on the optic tracts, chiasma, and nerves. As a rule, the pituitary tumour bulges upwards in front of the optic chiasma, and the result is the classical bitemporal hemianopsia.[4] Rarely, as in Case 2, the nerves and chiasma are pushed vertically upwards and are thus compressed between the tumour and the circle of Willis; the result will be papillœdema, with loss of vision later on. Under such circumstances it is obvious that the differentiation of the pituitary growth from an intracranial tumour elsewhere may be difficult, as a large tumour may, by pressure, cause signs of hypopituitarism. In Case 2 there was œdema on either side of the bridge of the nose; this commenced just after the onset of the drowsiness. I am unable to find a record of this sign in connexion with enlargements of the hypophysis; it is not alluded to by Cushing, Berkeley, or Walton, and the first-named of these authorities collected a relatively vast number of cases and studied them in the greatest possible detail. It is obvious that the œdema is caused by pressure on both cavernous sinuses or, more probably, directly on the ophthalmic veins, which have the angular vein as one of their tributaries.[5] Walton refers to pressure on the cavernous sinus as causing trigeminal neuralgia. The sudden interference with the local circulation can only be accounted for by some equally uncommon cause, and therefore one may infer that the speed of growth of the tumour was quite exceptionally rapid. Diplopia has been noted occasionally in such cases; it is conceivable in Case 2, where the oculomotor nerves were unquestionably on the stretch, that the visual hallucinations may have had diplopia as their sensory basis.

Epileptic fits occurred in Case 1, and, indeed, were the cause of death. There has been divergent opinion on the relationship of the pituitary to convulsive attacks and other fits. Cushing[6] assembles the data bearing on this matter in what would appear to be rather a convincing argument in favour of pituitary deficiency as a likely cause of idiopathic epilepsy. It must be admitted that many cases of hypopituitarism have shown epilepsy, and that many epileptics exhibit adiposity and a high sugar tolerance; but also that hypopituitarism of the most severe type may be unaccompanied by fits and that many epileptics are far from being obese. To extend the argument, one may instance the following almost commonplace facts: many cases of epilepsy are found post mortem to be associated with definite varieties of increased intracranial pressure, while the majority show no such condition; one case of general paralysis of the insane may show convulsive seizures while another of very similar course and pathology never has any; the same degree of uræmia (as far as comparisons are possible) may produce fits in one subject but not in another. An Italian physician[7] recorded a case in 1909 very similar to Case 1, quâ anatomy and symptoms, except that there was no epilepsy. I am, therefore, inclined to regard the epilepsy in Case 1 as having been due (in a predisposed subject) to the general pressure on the cerebrum rather than to hypopituitarism caused by pressure on the gland. Pituitary therapy for epilepsy was given an extensive trial in the United States over ten years ago,[8] but "has now died a natural death, though some of the manufacturers have tried to galvanise the corpse." In the latest published work by a physiologist on the pituitary, Sharpey-Schäfer's "Endocrine Organs," there is no indication that the relationship of the pituitary to epilepsy is to be taken seriously.

The *general effects*—viz., those due to interference with the normal function of the gland—are conspicuous by their almost complete absence. In Case 1 the mental torpor might be due to the pressure on the frontal lobes just as well as to pressure on the pituitary and, moreover, the absence of adiposity or anything suggesting Fröhlich's syndrome would make the former alternative more probable. In Case 2 there were, on the one hand, no signs of acromegaly or glycosuria and, on the other hand, no sign of increased carbohydrate tolerance or of polyuria. For over five months after admission to hospital no abnormal drowsiness occurred, there was no headache, and the patient was far from being indifferent to her surroundings. The drowsiness which ushered in the end of the illness was certainly very marked, and I am inclined to ascribe this symptom, in part at least, to pressure on the posterior lobe of the gland.

Pathology.—The normal anterior lobe of the human pituitary gland is composed of columns of cells surrounded by large sinusoidal spaces.[9] The cells are of three types: eosinophile, basophile, and neutrophile. *The basophile cells are not numerous.* The eosinophile cells are typical gland cells, and the presence of the granules indicates active secretion. Much experimental blood has been spilt in discussion as to whether these cells actually represent different types or merely different states of the same kind of cell. Many variations are noticed in normal glands as well as in pathological states. The actual histology of the normal gland (anterior lobe) and of adenomata arising from it suggests that, at any rate, the neutrophile and acidophile cells are different states of the same kind of cell; various grades of acid affinity are easily recognised. Even in the sections of the adenoma from Case 2 (Figs. 1 and 2), though the cells are neutrophile, yet they show a faint eosin stain, and in some cases a distinct, though faint, granular appearance. Acromegaly is produced by hypersecretion of the anterior lobe, but as hypersecretion and hyperplasia of a gland—e.g., the thyroid—are by no means synonymous, it follows that many cases of adenoma of the anterior lobe will never have acromegaly, but will show varying degrees of hypopituitarism caused by pressure on the posterior lobe. Also, the majority of cases of acromegaly show hypopituitarism in their later stages, and in such cases a chromophobe adenoma is found. Cushing's Case 1 is a typical example.[10] In our Case 2 actively secreting cells were not seen in the adenoma, and we are therefore not surprised that there were no signs of acromegaly. Had the growth not been so rapid we should have expected more definite signs of posterior lobe deficiency at a later period of the illness.

Case 1 is interesting mainly on account of its extreme rarity. An endothelioma of the infundibulum is a variety of sarcoma, and parts of it may resemble a spindle-celled sarcoma. Although Case 1 is described as a spindle-celled sarcoma, it probably has much the same cellular origin as the endothelioma; neither can honestly be described as malignant. The case described by Sandri,[7] which clinically resembled Case 1 so closely, was a round-celled sarcoma. Most frankly malignant growths in this region invade the base of the skull, and may reach the nose and nasopharynx.

References.

1. Cushing, H.: The Pituitary Body and its Disorders, Philadelphia and London, 1912, p. 41.
2. Ibid., p. 63.
3. Berkeley, W. N.: Endocrine Medicine, Philadelphia and New York, 1926, p. 182.
4. Walton, A. J.: Surgery of the Pituitary, Green's Encyclopædia, Edinburgh, 1923, vol. x., p. 508.
5. Cunningham, D. J.: Text-book of Anatomy, Edinburgh, 1903, p. 841.
6. Cushing, H.: Op. cit., p. 274.
7. Sandri, Oresti: Riv. d. Pat. Nerv. e Ment., 1909, xiv., 7.
8. Berkeley, W. N.: Op. cit., p. 207.
9. Cushing, H.: Op. cit., p. 3.
10. Ibid., p. 30.

TREATMENT OF "TENNIS ELBOW."

WITH SOME OBSERVATIONS ON JOINT MANIPULATION.

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THE point of view from which I propose to review this subject is that of the physiotherapist. It goes without saying that medicines and liniments have failed and the bone-setter has scored. The treatment therefore lies within the domain of physiotherapy and orthopædics, but my object is to discuss what can be done short of surgical interference.

Although the term tennis elbow is a misnomer, it is probably convenient to retain it, as it refers to a condition of pain or disability induced when the gripping muscles are brought into action. The pain is generally situated somewhere round the radiohumeral joint or in the extensor muscles of the wrist and hand near their origin. There may, however, be pain located near the inner aspect of the elbow. The condition occurs in golfers, usually through taking too much turf on hard or frosty ground, and twice I have seen it bilateral. It may occur from carpentry, sawing, and planing. I have seen it in a draper's assistant who did no more strenuous exercise than play skittles, but on the other hand motor mechanics doing very heavy work may acquire the same symptoms; one of my last patients was a man who amused himself by bending 6-inch wire nails between his hands. Writer's cramp would almost seem to fall into the same category, as I have occasionally seen this respond to some of the treatment described later. It has been suggested that only amateur tennis players get "tennis elbow," the professional players knowing better how to hold their racquets, but I have seen several Wimbledon competitors and at least one finalist who had the complaint, and the assumption is that men of that class would know how to grip their racquets.

Diagnosis.

Short of cutting into the joint as W. H. Trethowan has done, we have nothing positive to go on.

X rays give no help, so we are led to the assumption of strains, neuritis, effusions of one sort or another, or slight arthritis; the only positive thing is the exact location of the pain, and even that may vary during treatment. It is an essential of good practice that diagnosis should precede treatment, but considering the difficulty of exact diagnosis and bearing in mind many cases treated successfully, the question arises whether part of the diagnosis might not be deduced from a consideration of the results of different forms of treatment, together with some points in the location of the pain.

From the point of view of diagnosis, the chief things which the examiner may elicit, apart from the general indefinite pain in the muscles, are: (1) pain on pressure over the outer aspect of the radio-humeral joint; (2) pain on deep palpation over the anterior aspect of the same joint; (3) pain on pressure over the tendon of the long head of the biceps, a point to which I have never seen reference made; (4) occasionally pain on pressure over the front of the wrist, between the radius and ulna; (5) constriction applied round the upper part of the forearm reduces the pain of gripping.

In my experience there is no treatment so successful as manipulation of the elbow-joint. If that is so, we are bound to ask ourselves whether there may not be some subluxation, rotation, lesion, fixation (or anything else we may term it) in the joint. Why is there pain on pressure over the front of the joint as well as over the long head of the biceps? Suppose the joint has been jarred, is it possible that the head of the radius can remain twisted, even though anatomically it may seem improbable? Should that happen, there would also be a rotation of the bicipital tuberosity of the radius leading to a torsion of the biceps. That torsion would necessarily be very slight, but might account for the pain. The mechanics of the body are very wonderful, the different fibres of muscle tendon and ligament are arranged in certain directions for special purposes, just as lines of stress are arranged very methodically in the bones, and at present we are unable to say just how far small deviations from the normal may affect the health of the part. Likewise the joint interference may react on any of the surrounding tissues. Neuritis or slight arthritis may set in, but at any rate the muscles develop spasm and will not relax properly, with the result that a certain awkwardness of movement, want of coördination, or interference with proper synergic action takes place.

Treatment.

No one form of treatment is sufficient for all cases that present themselves, but I have now managed to arrange the different treatments in the best order with regard to probability of success and feasibility of application without undue waste of time: (1) manipulate the joint to ensure perfect alignment of the bones; (2) encourage the muscles to relax; (3) treat any remaining pain by the different electrical methods—diathermy, ionisation, light therapy, faradism, galvanic acupuncture; (4) massage.

The specific manipulation having been effected, the muscles should be coaxed into a condition of relaxation and freedom of action. Given a little encouragement, things tend to right themselves, and sometimes I allow the patient to play straight away just as he feels inclined. Generally speaking, games or any natural effort are better than particular exercises. In the latter case the mind is apt to concentrate too much on the affected muscles and keep up the spasm, whereas in the enjoyment of the game and the heat of the contest the muscles, so to speak, forget themselves. They suddenly begin to act in a normal loose manner and tend to lose their spasm, and once that happens they go on getting more supple.

Strapping the forearm, as advised by Frank Romer, is a very powerful aid at this stage of the treatment. Three pieces of strapping about 1¼ inches wide are cut long enough to encircle the upper third of the forearm with a slight overlap. They are applied upwards from the lower part of the upper third of the forearm, each succeeding piece slightly overlapping the previous one, care being taken to avoid creases. The last piece of strapping has a piece cut out of it to allow bending at the elbow. During the application of the strapping the patient keeps the elbow bent and the wrist and fingers flexed and pronated. It is not necessary to apply the strapping tightly, because when the patient dorsiflexes the wrist and clenches the fingers the circumference of the forearm increases; hence, during that action the strapping becomes tighter. The effect of the strapping will be to rest the painful extensor muscles, as owing to the constriction round them they will be unable to act to their fullest extent. The action of gripping will be accompanied by much less pain, even though the patient grips his hardest, and he will acordingly tackle his game or his work with much more confidence. The benefit of strapping can be gauged beforehand by grasping the relaxed forearm between the two hands. If the patient is then able to dorsiflex the wrist and make a fist without so much pain, the surgeon may safely proceed with the strapping.

The majority of cases will clear up with these measures; hence I put them in the foreground, and reserve other remedies until these have been tried. Bone-setters get the plums; they get the patients when the probability of success is greatest. When they fail it is probably because some other condition has been superimposed on the original bony lesion and the problem of putting the patient right is passed on to us. On that account I always anticipate that a case will be troublesome when I learn that it has previously been seen by a bone-setter.

Having failed to effect a cure by manipulation and strapping we may fall back on electro-therapeutic measures, but had these been used previously—e.g., ultra-violet therapy—the skin might have been too irritated to stand strapping. There is no guide to say whether ionisation, diathermy, or light treatment will be more efficacious, and our ingenuity may be taxed to its utmost limit. Any of them may suit one case and not another, and all of them may be tried without effect. In that case galvanic acupuncture may be tried, but I keep this as a last resort, as it is the least pleasant.

Different methods of application of electricity are already well known and need not be dwelt on, but galvanic acupuncture is not so commonly employed. An indifferent electrode is fixed to any part of the patient's body and a small active electrode stroked over the painful areas. A minimal faradic current is used, and search is made in one direction for any painful part—i.e., a part which is much more sensitive to that small current than the surrounding tissues. This is marked with indelible pencil; then the electrode is moved in a direction at right angles to the former until the painful spot is again reached. This is also marked and the point of intersection is chosen for the acupuncture. A galvanic current is substituted for the faradic and a needle attached to the negative pole is inserted straight into the tissues. The current is very gradually turned on until one or perhaps two milliamperes are registering, and the needle is gently moved about to make certain that it is still at the most painful spot. This current is maintained for about six minutes, after which the pain will usually be decreased. If two milliamperes can be borne then possibly three minutes will suffice, but if the patient can only stand one milliampere, six minutes may be necessary. Two or three such places may be treated at one sitting.

Massage has its uses but it is less effective than the other measures. At one time I tried to rely solely on it, but now I seldom employ it. The only massage of any use is deep kneading into the painful tissues. Sometimes exercising the extensors against resistance is beneficial, but this can also be done *electrically*, using the faradic current.

The Manipulation.

I find it more convenient to have the patient on his back with the arm just off the table. His hand, midway between pronation and supination, is held between the operator's legs. The elbow rests in the operator's hands and is passively flexed and extended several times. Then, when the muscles are relaxed, the elbow is sharply forced a little further into extension. There is seldom any need to use an anæsthetic if the patient's attention can be diverted; the manœuvre is practically painless, the whole thing being over before he realises what is happening. A certain amount of knack is necessary, and probably the most troublesome thing is to know just how much force to use. This comes with experience and is more easily learned by seeing it demonstrated. It should, however, be stated that the force is a guarded one and stops immediately the limit of extension is reached. That is to say, the operator's hands do not follow through, there being enough way on the patient's limb to carry it as far as necessary.

G. P. Mills has also described a method, but it is immaterial what particular movement is made for the replacement so long as the bones are separated. Nature is all the time trying to get things into their proper place, and if the joint surfaces are forcibly separated the chances are that they will fly back into their correct position. This statement is made with due appreciation of the fact that I may be accused of subscribing to the popular fallacy that a bone was out of place. On the contrary I am out to shatter that belief. A snap is usually heard during the manipulation, and bone-setters have fallen into the mistake of thinking that they have actually reduced a dislocation. Nor has it been difficult or without profit to them to persuade patients that they have pushed back into place a bone which was "out." Unfortunately, however, even some medical men have fallen into the same mistake. A satisfactory explanation of what happens has never been proffered. We are told that the snap is due to the breaking down of adhesions, and there the matter apparently ends, but this is not always true. In many stiff joints adhesions are broken down, but in many joints manipulated—particularly for "tennis elbow"—there is no evidence that adhesions have been broken down. There is, for example, no effusion or swelling round the joint after the manipulation, nor is there any pain or stiffness after the operation such as we might expect from the forcible rupture of adhesions. Moreover, it is questionable if the slight force employed would be sufficient to break any but the softest of adhesions, and these could not make any appreciable sound.

My own interpretation is that one of the bones—in this case the radius—becomes fixed somewhere within the normal range of movement; hence an X ray photograph would not reveal anything abnormal. The mechanism of the fixation is not easy to understand, but just as there is a dead point on the driving wheel of a locomotive, so there may be a dead point in a joint at which the opposing sets of muscles which move the joint refuse to function, and we do know that there is an optimum position of the joint for the best muscular effort. To carry the simile further, the joint manipulation simply carries the bones over the dead point, as the engine driver does when he levers the wheel over the dead point. The bone was no more out of place than the wheel. If any further proof were required that the bone was not out of joint it is only necessary to manipulate the joint on the opposite side, when an exactly similar sound will be elicited. It is, indeed, no different to what many people do when they crack their fingers and can be produced in practically every joint of the body.

LONDON FEVER HOSPITAL.—Last year there were 1351 patients under treatment, an increase of 78 upon 1928. The medical officers' report showed that 94 more fever patients were admitted than in the preceding year. The income was £32,290, and the expenditure £33,240, an increase of £3763. At the annual meeting Sir Charles Stewart, who presided, said that the immunising of the nursing staff had almost eliminated the risk of their being attacked by scarlet fever or diphtheria.

A NOTE ON VARIOLA MAJOR AND MINOR.

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THE last decennial International Conference on the Nomenclature of Causes of Death, held at Paris in October, 1929, prescribed the main heading Variola, with subheadings—

(a) Variola major.
(b) Variola minor; alastrim.
(c) Variola unspecified.

Its report has not yet percolated through the various national channels; when it has done so, it should lead to a further consideration of the disease small-pox. This report, recognising as it does the present state of things, marks a definite advance in official terminology. It contradicts the view that alastrim is a disease other than small-pox, while it affirms the view that there are two forms of small-pox. It is outside its province to define the terms it prescribes.

Unless the prescribed terms, variola major and minor, are defined, the present confusion, a confusion due to lack of definition, of which we have had recent examples, will be increased rather than dispelled by this report. In the summer of 1929 the French, noting the widespread prevalence of small-pox in this country, and learning of the *Tuscania* small-pox deaths, enforced certain sanitary regulations against this country, which they relaxed on being informed by our authorities that our prevalent outbreak was, in fact, of a trivial character. In November, 1929, a report that alastrim was causing a number of deaths in Holland was explained later as an outbreak of severe small-pox in the Port of Rotterdam.

A Disinclination to Define.

In this country it is now generally admitted that there are two forms of small-pox, but there is still a general disinclination to define them. For example, in the *Times* of Jan. 8th, under the heading "Small-pox in London," it was remarked, "the notifications of small-pox in London are gradually increasing; there are now 418 cases under treatment. . . . the cases are mostly of a mild type." There is an ambiguity about the phrase "mostly of a mild type," which, but for the absence of any mention of deaths, would seem to mean that, while the minor form is the prevalent one, cases of the major form are also present. These examples point to the desirability of defining the terms we are shortly to be directed to employ.

At the commencement, in this country, of the present epidemic of variola minor, Dr. S. M. Copeman, in reporting on a local outbreak, drew up a table in which he contrasted: (a) small-pox; (b) the outbreak under investigation, which he termed varioloid; and (c) chicken-pox. His opinion that the outbreak was becoming more severe in type discounted his table of differences. Since that time official investigation, so far as it has been published, has only pronounced variola minor to be variola without attempting to differentiate between the major and minor forms. If it is held that the treatment of the two forms of small-pox should be in all respects identical, then the need for differentiation is not immediately apparent, but, as a matter of fact, large sections of the public refuse for variola minor, treatment they would willingly accept for variola major. While refusal in the first case may or may not be regrettable, it might well be disastrous in the second; but if authority declines to distinguish between the two forms, can the public be blamed for considering all small-pox trivial until experience of the major form leads them to change that view?

Differentiation in Retrospect.

In retrospect epidemics of variola major and minor differ widely; the stumbling-block in the way of differentiation of an epidemic in being is the fact that one cannot say of an isolated mild case to which form it belongs. Diagnosis of an epidemic must, then, be made by considering a series of cases; if a dozen are enough for this purpose, that is all that is required internationally. For internationally a port is not considered infected until there are groups of cases, and so international notification can be deferred until variola major or minor can be notified from a series of cases, but we should use the term variola unspecified while we are in doubt, during which period the treatment would be that for the major form. Five years ago I advocated in your columns the subdivision of small-pox, using the three terms now approved internationally, and I suggested how they might be defined, setting out the method of definition in greater detail at the Conference of the Royal Sanitary Institute at Hastings in 1927. I hold that if a consecutive series of variola major cases be contrasted with a consecutive series of variola minor cases, they will exhibit certain differences from each other. Half a dozen cases should be enough to demonstrate them, but a dozen would be on the safe side. The cases must be consecutive, not selected, for mild cases are always to be found in major outbreaks and cases of borderland severity in minor epidemics.

Briefly, the difference between the two forms being that of virulence, this shows itself in the relative severity of the worst cases and in the relative duration of the effectiveness of vaccination in the two forms. For example, the first Willesden outbreak of small-pox was of ten cases; there were three deaths from hæmorrhagic small-pox, and a child of 12 vaccinated in infancy (four marks) had a copious rash. Any one of these four cases stamps that outbreak as variola major; the child, because her vaccinal condition precluded her from being a case of variola minor, which, if she could have contracted at all, would have had but the sparsest rash by reason of her partial vaccinal immunity. I consider the records of past and present epidemics should provide plenty of similar material, and that an investigation is called for on the lines suggested above. It would, I think, be well to limit the general practitioner to the diagnosis (c) variola unspecified, and to leave the public health authority to assign the cases to the major or minor group, when able to do so, by means of a review of a series of cases.

Definition and Vaccination Policy.

Apart from the international advantage to be gained from defining the two forms of small-pox, there are other reasons for doing so. The present state of our knowledge (or lack of knowledge) of vaccination and post-vaccinal encephalitis makes the matter urgent. The Vaccination Committee reported that a risk of post-vaccinal encephalitis was incurred by children other than infants and by adolescents if they underwent primary vaccination. In the Vaccination Order of August, 1929, occurs the following:—

> "The Minister is of opinion that in the present state of our knowledge, and so long as the small-pox prevalent in this country retains its present mild character, it is not generally expedient to press for the vaccination of persons of these ages who have not previously been vaccinated, unless they have been in personal contact with a case of small-pox or directly exposed to small-pox infection."

It seems obvious that, whatever is advised, primary vaccination at the dangerous age is being practised less and less, and rightly so in our present state of uncertainty. We are supplied with one Government lymph only, for use at all ages under all conditions, we are told to use it for infants and to repeat the dose at seven and again at 14 years of age; therefore, presumably, it confers immunity for seven years, but if so, surely it is unnecessarily potent for the vaccination of contacts at the dangerous age, where all that should be attempted is to confer an evanescent protection by means of a minimal dose of an agent which may be for them of a lethal character. From time to time one hears of vaccination enthusiasts who say, quite rightly, that a small-pox mortality would restore the prestige of vaccination. I hold that against variola major its use is imperative, but that it is not justifiable against the minor form because of the trivial nature of that form of small-pox and the seemingly dangerous nature of the prophylactic; and that the failure to distinguish between the two forms is bringing vaccination into discredit.

An Analysis of Small-pox Deaths.

In his last annual report the Chief Medical Officer of the Ministry of Health supplies another argument in favour of subdivision and definition, for he quotes the Registrar-General's figure of 53 small-pox deaths in 1928, and then follows it by a Table giving particulars of these deaths. The list begins with a person aged 89 and ends with one aged 84 whose death certificate reads: (1) (*a*) heart failure; (*b*) old age; (2) suspected variola (petechial); no p.m. Of these 53 so-called small-pox deaths, 23 are over 70 years of age, 4 of them are infants; of the remaining 26 it may be said that 15 of them have other diseases mentioned on their certificates, which make it probable that the small-pox was, if of any, then of only secondary importance as a cause of death, and we are left with only nine out of the Registrar-General's total of 53 who may have died of small-pox. Indeed, it seems not unreasonable to assume that variola minor is a non-fatal form of small-pox save at the extremes of age or in the presence of some disease or injury which is itself a common cause of death. Quite two-thirds of the variola minor cases occur in the age-period 1–30 years, while the Registrar-General records only five small-pox deaths for this age-period; it would be interesting to learn whether or no any of these deaths were due to the severity of the small-pox, for this is the age-period when vaccination may be dangerous but is deemed necessary for contacts. The vaccinator who vaccinates persons of this age in the light of the Vaccination Committee's report incurs a grave responsibility even though supported by the dictum of a Minister. The apparent eccentricities of the Registrar-General are usually explainable as due to international regulation; the method of estimating small-pox deaths is roughly to count all persons with small-pox who die as deaths from small-pox; this may have been fairly accurate when the prevalent disease was variola major, the C.M.O. has shown how very incorrect it is when the prevalent disease is variola minor. One hopes that, when the new report appears, the Registrar-General will receive fresh international guidance; if he does not, then it will be necessary for him to issue both an international and an amended report of small-pox deaths, of which Sir George Newman's Table would seem to be a forerunner.

For the last ten years variola minor has steadily increased in this country, therefore as regards this form of small-pox the plan of treating variola as an indivisible unit has largely failed. There have been several small outbreaks of variola major where our methods would appear to have been successful, notably the *Tuscania* outbreak in which the public press emphasised the subdivision. Administrative methods, even if considered ideal, require to be adjusted to actual conditions. The primary condition for effectiveness is that the method be acceptable, and this is far from being the case at present. It is of interest that in 1923 Gloucester, a town rabidly antivaccinist, allowed variola minor, under the pseudonym of chicken-pox, to proceed unchecked for six months, the cases were then isolated in hospital as small-pox; a few cases continued to occur, but by the end of the year the epidemic was at an end. Elsewhere cases are isolated in hospital, contacts are pursued with vaccination, and in some places the epidemic lasts for years. Active measures at the start of an epidemic may, and sometimes do, appear to bring an epidemic to an end, although it might have died away without them, for we know that a large proportion of the unvaccinated contacts escape the disease, and that many cases, because of their mild ness, escape detection. Variola minor having established itself in an area it seems futile to attempt to eradicate it.

Conclusion.

On the whole, then, the differentiation and definition of variola major and minor based on the review of a small series of cases does not seem to be difficult. The existence of two forms is generally admitted; internationally their existence is to be officially recognised; the public here already subdivide smallpox. Any medical measure to be effective must be acceptable. Our treatment of variola minor has been a failure because unacceptable. Unless the two forms of variola be defined the same treatment is necessarily advocated for each. In view of the uncertainty in regard to vaccination and post-vaccinal encephalitis variola minor should be defined so that our advocacy of vaccination in regard to it may be reconsidered. In fact the Registrar-General's return gives an erroneous impression of the severity of variola minor. Variola major, if separated from the minor form, will be more easily treated. Non-epidemic vaccination is not acceptable to a large section of the community, therefore the ideal of the general immunisation of the community is at present impossible of realisation, and the epidemic treatment of variola major should occupy our attention, but until the major and minor forms are defined and separated we remain in a state of ignorance potentially dangerous.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ORTHOPÆDICS.

AT a meeting of this Section on March 4th Mr. D. **McCRAE AITKEN**, the President, took the chair, and Mr. S. A. S. **MALKIN** opened a discussion on

SPASMODIC FLAT-FOOT.

The scarcity of references in the literature, he said, made definition difficult, but he suggested that spasmodic flat-foot be defined as a condition in which the foot, without evidence of a bony lesion, was held in a valgus position by spasm of the peronei. Sir Robert Jones, in his "Notes on Military Orthopædics," had described the condition vividly. The patient limped with a springless gait, with the feet practically rigid and the toes pointing out. The feet were both everted and the inner border over the region of the scaphoid appeared thickened and even angular. There might be a history of injury such as a fall on the feet; usually, however, the patient could not account for the trouble. The pain was often acute and the feet perspired abnormally. Removal of the boots gave relief. The patient could not invert the foot and, if he tried to, the peronei became rigid. Pain was felt on pressure over the deltoid ligament, the scaphoid, and the tip of the external malleolus where it impinged upon the os calcis, and tenderness over the peronei along the outer border of the foot. Gentle attempts to invert the ankle produced much pain, the peronei standing on guard to resist the movement. If, however, the patient's attention were distracted and the foot, after gentle pressure in this direction, were suddenly and forcibly inverted and held, its character and contour were completely changed. It was no longer rigid, osseous changes were obviously absent, and the general appearance was almost normal. When the foot was released, the rigidity and deformity returned.

The question arose which was primary: the spasm of the peronei or the valgus position; and of whether the spasm was merely protection or required some other explanation. Mr. Malkin outlined the anatomy of the foot, and the mechanism by which flat-foot was produced. Tests made by the speaker with a spring balance on groups of children had shown that the inverters were stronger than the everters in normal subjects, and in cases of flat-foot after treatment, but that in patients undergoing treatment the everters were stronger. If, therefore, in these patients there was a lesion of the subastragaloid and mid-tarsal joints, protective spasm might be expected to hold the foot not in inversion but in eversion. This position—normally a position of rest—led to continuous and intensive strain on the ligaments and joints involved, and might lead to adaptive shortening of the muscles. The result was a vicious circle. An exaggerated position, no longer one of rest, was adopted, and there was a loss of postural tone and partial reversion to a position comparable with that of the anthropoid. The weakened everters were placed under the disadvantage of having to restore the arch in order to invert and adduct the foot. Protective spasm would only be evoked by some injury of the joints, and spasmodic flat-foot was more likely to be a protective spasm if (1) there had been an actual or potential injury or strain of the mid-tarsal and subastragaloid joints, and (2) the spasm affected other muscles besides the peronei. Statistics showed that a large proportion of cases gave a definite history of injury or were of an age when liability to trauma or strain was greatly increased, and it was generally accepted that most patients showed spasm of the extensor longus digitorum as well as of the peronei. These facts, combined with other evidence, suggested that the spasm was protective, and there was no reason to doubt that it was at any rate secondary.

Treatment.

Treatment had varied according to whether the condition was regarded as primary or secondary. Some authorities thought that spasm of the peronei was a self-limiting disease and needed no treatment; Naughton Dunn, taking a different view, had crushed the peroneal nerve, and others had anæsthetised it or had infiltrated the peronei and extensors. Good results had been reported. Others again had wrenched the foot into an inverted position, dividing or exsecting part of the peroneal tendons and then treating for flat-foot. Adequate training in childhood could prevent many cases, for the deformity could usually be voluntarily corrected by patients under fourteen and was not then true spasmodic flat-foot. The treatment in this group consisted of flat-foot exercises, particularly for the inverters; general postural re-education; inside wedges and night splints to hold the feet inverted. The results were uniformly satisfactory. In cases where the spasm disappeared under anæsthesia the treatment was manipulation, fixation in full inversion and adduction for six weeks, and then exercises. Outside irons and inside T-straps were fitted if the inverters were particularly weak. In cases where there was definite contracture, this treatment was preceded by division of the peronei. The results had been completely satisfactory in 8 cases out of 15, and 5 had been improved. The rarity of the condition in the speaker's experience might, he thought, be due to better postural instruction in schools.

Mr. E. P. **BROCKMAN** analysed 27 cases, most of whom had attended at 15 or 16 years of age, having been at work a year or two at occupations necessitating much standing about. The left foot was the more often and more severely affected. Quite a number had given a history of accident, but this had usually been trivial, indefinite, and difficult to associate with the symptoms. All the patients had had good general health. Spasmodic pes planus was a clinical entity and quite distinct from other varieties of flat-foot; it was the commonest type in adolescents. The fore-foot was held in rigid abduction, eversion, and dorsiflexion by the two peronei and the extensor longus digitorum. Pain arose both from spasm of the muscles and from the resulting arthritis of the tarsal joints. Pressure over the outer side of the foot, especially over the calcaneo-cuboid joint, was painful, and showed inflammation of this joint or its capsule. There was no tenderness over the inner side of the foot. He agreed that the spasm must be protective, and suggested that its object was to limit the movement of the calcaneo-cuboid and cubo-metatarsal joints. The resistance of the condition to treatment suggested some cause other than a purely mechanical one; he suggested a primary mechanical arthritis with a superadded infection or intoxication, and mentioned the theory of tonsillar infection.

Treatment had restored the foot to its normal shape in 5 patients only out of 18 he had examined; the remainder had been freed from symptoms but their feet had remained rigid, with some permanent contraction of the peronei and extensor longus digitorum. The measures adopted had been manipulation under anæsthesia, plaster fixation in abduction and inversion for six weeks, exercises, and wedged shoes. Tenotomy of the peronei and excision of a portion of the muscles had not appeared to produce permanent improvement. Outside irons with T-straps had relieved the symptoms in a few patients who had continued at work. In early cases the feet could be manipulated comfortably into good position under anæsthesia, but in late cases correction was impossible. Mr. Brockman deprecated the removal of these patients from work for a treatment which would probably be useless, and recommended that they should simply be provided with supporting devices.

Mr. NAUGHTON DUNN said that the increase in facilities for preventive treatment had greatly reduced the incidence in the last 20 years. If peroneal spasm was present the child could not stand on the outer border of its feet; this test distinguished the condition from ordinary flat-foot. In questions of legal compensation he always held that an accident must have been a predisposing cause. Early cases should be put in plaster in the correct weight-bearing position, and treated by rest followed by exercises. The correct position was the most important part of the treatment of all cases. When manipulation had restored the arches, the foot should be inverted at the subastragaloid joint and the os calcis forced in and fixed under the astragalus in its proper relation to the bones of the leg. The fore part of the foot should then be pronated so that the first and fifth metatarsal heads were weight-bearing surfaces. There was then no need for the position to alter when the foot was taken out of plaster. Where, although the condition was three to six months old, the arches could be easily restored under an anæsthetic he advised the operation of cutting down over the head of the fibula, exposing the three branches of the external popliteal nerve and crushing the musculo-cutaneous nerve. This threw the peronei longus and brevis out of spasm. After nine days the patient could start walking and simple flat-foot exercises. These muscles remained out of spasm for three or four months, after which time the patient had regained normal balanced control of the tarsal joints. The operation was useless when osseous flat-foot had set in or true shortening of the peronei had occurred. In old-standing painless cases with tarsal arthritis it was probably better not to interfere, but in recent osseous flat-foot the peronei should be divided, the deformity corrected, and the feet fixed in plaster in the correct position

“Tonsillar Foot.”

Mr. W. H. TRETHOWAN said that the condition had nothing to do with flat-foot, but was so constantly associated with large and septic tonsils that he had named it “tonsillar foot.” The primary incidence of the infection was in the astragaloid and subastragaloid and not the calcaneo-cuboid joint. The name “flat-foot” was bad; most patients in the early stages had very good arches. They were cases of spasmodic valgus. The condition most resembling it was the foot of rheumatoid arthritis when the mid-tarsal and subastragaloid joints were involved first. A minor injury might predispose. Treatment was prolonged rest, re-education, and the removal of septic foci. He had long given up manipulation and plaster. Only the earliest cases recovered. It was intractable because adaptive and osteophytic changes arose very early. The pain was on the outer side of the joint, about the region of the short extensors of the toes; it was, he thought, secondary, and due to pinching of the synovial membrane or capsule through spasm.

Mr. E. MUIRHEAD LITTLE recalled that 50 years ago the condition had been much more common and had chiefly occurred in young adults such as errand-boys, in beer-drinkers, and in elderly waiters. When the spasm had given way under anæsthetic, fixation in approximately the equinovarus position, with surgical measures if required, had given good results, but it had been considered important that the patient should abandon the occupation which had caused the trouble. He considered that Mr. Trethowan's remarks should be followed up.

Mr. P. B. ROTH recommended manipulation, division of the peronei tendons and, generally, of the extensor communis digitorum; fixation in plaster for a month, and then wedged and T-strapped shoes. The condition usually occurred in “curious-looking” boys and girls, not normal ones. The definition should include the expression “painful,” and admit spasm of other muscles besides the peronei.

The CHAIRMAN, considering the evidence for a primary spasmodic flat-foot, recollected cases in heavy, flabby messenger boys, not ordinary hardy adolescents, but in what a colleague had called the “mucous” type. He had wondered at one time whether the condition was not associated with a thymus disorder. He had seen the spasm disappear in sleep, but not always in cases diagnosed as spasmodic flat-foot. Sir Robert Jones, before the days of plaster, had corrected the valgus of the heel by putting the foot up for three weeks in full abduction, with a large pad of wool between the heel and the sub-splint, and the sole turned right in; he had then fitted ordinary crooked shoes. Mr. Aitken himself had reverted to this method in preference to plaster. Walking on the outside of the foot was incorrect; when patients walked in plaster the fore part of the foot must be in a normal position.

Mr. LITTLE remarked that hot-air baths relieved the spasm.

Mr. MALKIN replied.

SECTION OF COMPARATIVE MEDICINE.

A MEETING of this Section on Feb. 26th, with Capt. S. R. DOUGLAS, F.R.S., the President, in the chair, was devoted to

CANINE DISTEMPER.

Mr. THOMAS DALLING said it was now known that there was a specific virus associated with canine distemper, that it set up a special train of symptoms when inoculated into or brought into contact with suitable dogs, and that by means of suitable antigens a natural immunity could be induced against infection. In the experience of Mr. Dunkin and himself, and in the records of cases sent by others who had used the antigen which he and Mr. Dunkin had prepared, it had been successful in 99 per cent. They had been asked to undertake the making and issuing of a prophylactic preparation on a large scale to members of the veterinary and medical professions. On the whole, the results from the use of this prophylactic had been fairly good. There had been failures, but some veterinary surgeons had had nothing but excellent results. In two series of 140 and 217 cases there had been no failures. The untoward happenings could be divided into three groups: (1) illness following immediately after injection of the vaccine, or the virus, or both; (2) nervous disturbances following its use, coming on perhaps months later; (3) a breakdown of immunity a considerable time after the injection. As to the first of these, if on receiving the vaccine the dogs were healthy and had not recently been exposed to the infection, they showed no appreciable departure from normal health. When the virus was injected seven days or more after the vaccine, a proportion of dogs showed some disturbance of general health, in the form of raised temperature, watering of the eyes and nose, and some diarrhœa. It was usual for these symptoms to be transient; but some of the animals seemed to be severely affected and required careful nursing. In a few death occurred, but the fatality risk was under 1 per cent. In the second category came fits of all degrees; some said that hysteria resulted from the vaccine and virus. In rare cases choreic symptoms were noted, and there was a record of one case of true encephalitis, the disease being confirmed at autopsy. When fits occurred months afterwards they were attributed to a breakdown in immunity.

There were several possible explanations for the mishaps. One was that the quality of the vaccine and virus might have been defective. Testing by the Laidlaw and Dunkin method, only a vaccine which fulfilled the requirements was issued. It was necessary to know the exact time for obtaining tissues, so that they should contain the maximal quantity of virus; it was also important to ensure that the living virus in the tubes should arrive for use in a potent condition. One dose of vaccine should be followed by the use of the living virus in order to obtain the greatest immunity. One cause of mishap, clearly, was the inoculation of dogs which at the time were exposed to infection. Temperatures should always be taken before subjecting the animals to the injection. Pups younger than three to four months should not have the treatment, though there were records of dogs having the treatment after six weeks old. Some post-mortem examinations showed that the distemper virus existed in the tissues of some dogs which had been immunised, but the immunity induced did not suffice to protect against natural infection. In some cases of apparent breakdown the presence of the distemper virus could not be demonstrated; some had the pneumococcus and the symptoms of pneumonia, and a hæmolytic streptococcus was isolated from the lungs. In some cases the culprit was *Bacillus bronchisepticus*.

Secondary Organisms.

Mr. G. W. **DUNKIN** thought it was desirable that the question of distemper immunity should be discussed, because of the publicity which had been given to it. The position was still the same as a year ago—namely, that it was possible to confer a lasting immunity on dogs and ferrets by means of suitable agents. Experiments, many of them voluntary, carried out under ideal conditions, dealt with 2000 dogs and hounds, which were treated by 90 veterinary surgeons, and the deaths from all causes following inoculation amounted to less than 1 per cent. of the animals treated. Since then many thousands of doses had been distributed. In all the experimental work with which the speaker was concerned there was only one case of pneumonia. The latter, however, was common in field cases, and a frequent accompaniment of the pneumococcus was a streptococcus. It had yet to be settled whether dogs which had been immunised against distemper by the vaccine-virus method were also protected against those bacterial infections which were met with in the field. The diagnosis of distemper cases in the field was not easy; 99 per cent. of the hounds examined had shown the presence of the pneumococcus, so there was at least a double infection. Mr. Dunkin was now quite satisfied that a dog which had been protected by a vaccine of good quality, followed by a living virus, was protected not only against distemper but against the usual secondary infections encountered in such cases. The diagnosis of distemper from *B. bronchisepticus* and streptococcus infection was not likely to draw dogmatic statements from even the most experienced veterinarian; the aid of the laboratory must be enlisted. It was very important that the dogs should be in good health before receiving the injections. The virus of distemper was very unstable. He did not consider that a lasting immunity could be conferred by the injection of the vaccine without using also the living virus. A vaccine, properly prepared, could not cause illness; it consisted of a 20 per cent. suspension of finely minced dog tissue which originally contained the living distemper virus, but which had been killed by formalin. A small quantity of ammonia was added to prevent irritative effects. Therefore if a dog was ill before the virus was given, there was only one explanation—namely, that it was in the incubative period of the disease before the virus was given. If the illness was due to some other infection, naturally the virus could not be held responsible.

Discussion.

Mr. **HUMPHRY NEAME** hoped that the public would gain a right conception on the matter as a result of this meeting. One of the symptoms which the dog with distemper showed was a parenchymatous keratitis, quite distinct from that condition of the conjunctiva which caused it to discharge. A dog which had this keratitis did not show a clear-cut image of a window or other object on the cornea; the image was hazy and woolly. If that could be regarded as diagnostic of distemper, it was a sign readily recognised and therefore of value.

Dr. M. J. **ROWLANDS** also urged that the public should be informed as to the true state of knowledge on the subject; the misleading statements in some newspapers led to wrong policy in a number of kennels.

Mr. S. G. **BILLINGTON** said that for nearly seven years he had been investigating canine distemper as an example of a specific infective disease. He had made a study of the habits of the causal organism, had tried to evolve a curative remedy, and to form conclusions as to prophylaxis. In 1923 he took 40 blood cultures from dogs in various stages of distemper, and obtained the same organism in 36 of them. This organism he then referred to as the distemper leptothrix, and he considered that in its virulent stage it was a filter-passer. There were three definite stages of the disease. The first was the early, pre-secondary infection stage; the second the pre-moribund stage—i.e., that in which the infection was distemper plus some secondary invading organism. In the third or moribund stage the animal had absorbed a lethal dose. Stage 2 was the important practical one. A syndicate had been formed to distribute his remedy, but he had been unable to get a sufficient clinical backing. He decided to make a fresh start, on virgin soil—namely, America. The University of Pennsylvania were now testing it, and the reports so far were that it was very successful. Prophylaxis was very difficult, for the weakness in the susceptible animal was probably due to endocrine inadequacy.

Mr. **LIVESEY** had arrived at the conclusion that from the point of view of the clinician it was difficult to say when a dog was free from distemper. It had been pointed out how important it was that before making the injection the dog should be healthy, the thermometer reading being relied on for this. In the incubative stage the temperature might rise early, but fall a little later, and the reading might be taken at this fall and a wrong conclusion arrived at. Three weeks' isolation before carrying out the injections was his recommendation. He hoped the diagnosis of distemper would be very definitely arrived at, because at the moment three diseases were receiving that name, apart from complications. He did not know whether chorea in the dog was a sequel of the pure distemper infection.

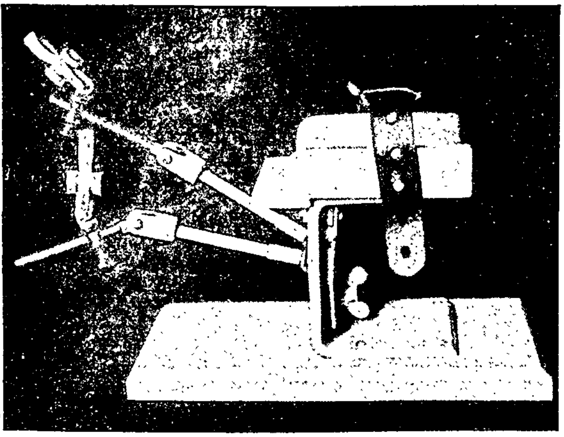
Mr. A. A. **COMERFORD** agreed with another speaker that it was difficult to know what hounds were suffering from distemper. He related some experiences in a number of kennels which seemed to show that the virus supplied for the purpose was not potent when actually injected. He knew of foxhounds which were immunised with material received from Mill Hill three years ago, and those dogs were still standing up against distemper, and therefore he assumed that they were immune for life.

Mr. W. TURNER WARWICK writes:—May I amend the report (THE LANCET, March 1st, p. 457) of the remarks I made in the discussion at the Royal Society of Medicine by the Proctological Subsection on Factors Making for Safety in the Surgery of Colon and Rectum? Actually I described and advocated the two-stage abdomino-perineal operation by the method of Coffey for high rectal and pelvi-rectal growths, and made the following remarks: "The operation thus performed is within the powers of an average surgeon (in contra-distinction to the ordinary one-stage abdomino-perineal operation); the after-treatment demands no special experience on the nursing side, and the late results should in no way differ from those of an abdomino-perineal operation successfully performed in one stage."

New Inventions.

A NEW DEVICE FOR OPERATIONS ON THE HAND.

THE small instrument here illustrated was designed by Mr. J. H. G. Robertson (60, Pentland-terrace, Edinburgh) to overcome the difficulty of maintaining suitable exposure and immobility while operating upon injuries of the hand. The wrist is held in a shallow gutter by an elastic strap, the shelf projecting as far as the middle of the metacarpal region. The construction of the two arms is made clear in the diagram; both work on a ball-and-socket joint and have a free range of movement. By means of the butterfly nut and hinge a suitable degree of stiffness is maintained and complete immobility can be secured when required. The joint in the middle of the arms is moderately stiff and needs no adjustment. The clips are fitted with springs enabling them to retain a firm hold of the fingers. Both clips hinge freely on their sliders in the axis of the rods, and the sliders themselves can be moved up or down the rods and fixed by a turn of the screw. With the palm either upwards or downwards by grasping a finger in each clip and manipulating the arms any required position can be maintained. The complete extension and wide abduction obtainable are of help in such an operation as amputation, particularly where no assistant is available.



Reviews and Notices of Books.

A SYSTEM OF BACTERIOLOGY IN RELATION TO MEDICINE.

Vol. II. By C. H. BROWNING, W. BULLOCH, J. H. DIBLE, A. FLEMING, F. GRIFFITH, R. TANNER HEWLETT, J. E. MCCARTNEY, T. J. MACKIE, D. G. S. MCLACHLAN, J. W. MCLEOD, W. MAIR, E. G. D. MURRAY, G. H. PERCIVAL, W. M. SCOTT, A. L. TAYLOR, W. J. TULLOCH, H. D. WRIGHT. Medical Research Council. London: H.M. Stationery Office. Pp. 420. 21s.

THE second volume (the third to appear) of this important work consists of seven chapters, each containing a full account of a group of bacteria and their relations to disease. It is a relief to find that the well-known titles of Pneumococcus, Meningococcus, Gonococcus, and *B. influenzæ* are used and that the less familiar "generic" and "specific" titles of *Streptococcus pneumoniæ, Neisseria gonorrhϾ, N. intracellularis*, and *Hæmophilus influenzae* are not present currently in the text. The classification of bacteria as far as is possible into genera and species is a useful systematic exercise, and may lead to important conclusions regarding their evolution or pathological action, but, as in many other groups of living things, generic names are apt to be changed as knowledge advances, and therefore either an accepted title, or the specific name where this has some fixity, is often the best for practical usage.

Seventeen authors have contributed to this volume, which includes interesting and valuable historical notes by Prof. Bulloch. The chapters on gonococcus by Prof. Tulloch, meningococcus by Dr. Murray, and staphylococcus by Dr. Fleming are, in one sense, the most complete, since knowledge of their subject matter has grown relatively little of late years. This is especially true of the staphylococcus, which has been studied longest. Strains of meningococcus from epidemic sources form, as is natural, the chief basis for Dr. Murray's chapter; he presents a wealth of important facts, including many personal observations. A fuller study of strains from sporadic cases would, perhaps, give a wider horizon to the subject. Prof. Tulloch's account of the gonococcus covers a larger field, corresponding to the more continuous and varied clinical sources of cultures. In spite of his assertion that absorption of agglutinins will readily distinguish the gonococcus from the meningococcus it is not clear that this would always be possible, more particularly in the case of strains from septicæmia or joint lesions associated with the less known types of organism. This doubt is emphasised by his statement that the gonococcus may cause meningitis, and the meningococcus vulvitis. To the chapter on pneumococcus Dr. Mair contributes 13 pages on cultural characters and biochemical activities, including a full account of autolysis and bile solubility. Prof. McLeod summarises the very extensive work on pathogeny in pneumococcal infections, and Dr. Griffith deals with the significance of "types" and their various antigens, serum therapy, and prophylactic vaccination. Prof. Browning writes on the action of antiseptics in vitro and in vivo. Much of this chapter refers to work so recent and suggestive of wider application that it especially deserves careful study. Intensive investigation of the streptococci has been pursued by many workers, especially since the war, and the difficulties of identification, variation, and classification in the whole group are critically surveyed. In an article of 150 pages Prof. McLeod devotes 42 pages to the general bacteriological aspects, including the hæmolytic and other biochemical properties, and Dr. Mackie, Dr. McLachlan, and Dr. Percival discuss the hæmolytic streptococci in human disease in 29 pages. Much of the newest work on this sub-group centres round streptococcal toxin and the relations between strains from erysipelas, scarlet fever, and puerperal fever. The stricter definition of hæmolytic power to the ability to form a heat-labile soluble hæmolysin, as insisted on by Prof. McLeod, might lead to a clearer conception of the relations of the pathogenic group. The section of 26 pages by Dr. Wright on the heterogeneous group of "mouth streptococci" includes the various strains known as *S. viridans*, and many of the strains which are less acutely pathogenic for man and animals. Prof. Dible describes in 13 pages the varied characters of "bowel streptococci," and among them recognises a group of "enterococci" with definite characters but low or doubtful pathogenicity. Anaerobic streptococci, dealt with by Dr. Taylor, are held sometimes to increase the morbid changes when associated with other bacteria.

What is known of the action of chemical substances on streptococci is told by Prof. Browning. The excellent chapter on the "Influenza Group of Bacteria" is written by Dr. W. M. Scott, with the exception of a section by Dr. McCartney on *B. pneumosintes*. Besides a description of the bacillus of Pfeiffer, its cultural needs, and the serological, morphological, and biochemical differences between the strains, there is a thorough and well-balanced discussion on the causation of influenza and the part played by the various secondary invaders. The possibility that a virus is the essential ætiological factor is fully considered, but the evidence in its support is held to be unsatisfactory. The apparent identity of the Koch-Weeks bacillus with *B. influenzæ* is commented on. The ability of Bordet's bacillus (*B. pertussis*) to grow without the accessory substances in the media required by *B. influenzæ* is accepted by Prof. Hewlett as a reason for placing it in a separate group. Bordet's bacillus is regarded as the cause of whooping-cough, and the diagnosis of the disease by means of cultures and its treatment by vaccines is discussed. In the same chapter are also included Ducrey's bacillus of chancroid and the Morax-Axenfeld bacillus of conjunctivitis.

If the remainder of the "System" is up to the standard of the volumes so far published, the Medical Research Council may be well content with their undertaking.

PERNICIOUS ANÆMIA.

By L. S. P. DAVIDSON, M.D., F.R.C.P.E., Lecturer in Systematic and Clinical Medicine to the University of Edinburgh; *and* G. L. GULLAND, M.D., F.R.C.P.E., Professor Emeritus of Medicine in the University of Edinburgh. London: Henry Kimpton. 1930. Pp. 293. 25*s.*

IN spite of the interest which it has attracted for the past half century, and the close attention which has been focused upon it in a concentrated degree for the past two or three years, our knowledge of pernicious anæmia remains disappointingly small. The dictum of Cohnheim that abnormal formation of the blood is the fundamental factor in the disease has become firmly established, and that is something. As to what brings about that abnormal formation we remain in darkness—a darkness in which the searcher is continually knocking up against the debris of shattered theories mainly with a bacteriological foundation. Dr. Davidson and Prof. Gulland make a thorough and more or less dispassionate survey of the geography of this limbo, the net result of which is negative; in spite of ethereal sulphates, portal hæmolysis, focal sepsis, auto-intoxication, intestine, sepsis, and many another promising theory, the way to an understanding of pernicious anæmia remains hidden. It is true that W. B. Castle's recent work on the relationship of the stomach to the condition does offer some hope of a better understanding, but the time is not yet ripe for its evaluation. On the ætiology of the disease, then, the authors find themselves unable to come to any definite conclusions. Faced with the facts of changes in the nervous system, bone-marrow, and stomach, they postulate a congenital defect in all these tissues and in the liver as well. They appear to place pernicious anæmia in the class of the abiotrophies. That, however, is not the whole of the story. They believe that even in the face of the abiotrophic constitution some precipitating factor is necessary. As to what this may be, they do not venture beyond the guarded statements that "the intestinal tract is of prime importance," and that "the liver with its contained 'blood hormone' is the connecting link between the bone-marrow and the intestinal tract."

Twenty-five pages of the book are devoted to a full reproduction of the original paper in which Dr. Davidson reported his demonstration of the fact that the fæces of pernicious anæmia patients contain more organisms than those of normal controls; a further 12 are devoted to the Milner Fothergill essay for 1928; the concluding 30 pages comprise an admirable appendix by Miss Ruth Pybus, sister dietetian to the Edinburgh Royal Infirmary, on the dietetic treatment of pernicious anæmia; this section contains many useful recipes and suggestions for the cooking of liver, and should prove of the utmost value.

THE NEUROSES.

By ISRAEL S. WECHSLER, M.D., Associate Professor of Neurology, Columbia University. London W. B. Saunders Co., Ltd. 1929. Pp. 330. 18*s.*

WE are in substantial agreement with the opening sentence of Dr. Wechsler's preface, that "the neuroses constitute the most ill-defined and least understood entities in the whole domain of medicine." And we believe, too, that the constant war between the rival camps of the somatists and the psychopathologists (of which he speaks) will continue just so long as there is indefiniteness as to the nature and pathogenesis of neurosis. Introductory chapters deal with the historical aspect of the subject and supply a detailed account of mental mechanisms and of the way in which these are utilised to support various current hypotheses associated with the names of Adler, Jung, Freud, and others. Dr. Wechsler avows himself in the main a follower of Freud, and his book accepts a view of neurosis ætiology in accordance with the contentions of that psychiatrist. The classification adopted by the author includes: (1) "actual neuroses" (anxiety neurosis, neurasthenia, hypochondria); (2) "psychoneuroses," divided into "transference neuroses" (hysteria and compulsion neurosis), "narcissistic neuroses" (paraphrenia, schizophrenia, manic-depression, and paranoia), and other "regression neuroses" (perversions, &c). The rest of the volume is taken up with their systematic description and treatment. So far it follows accepted Freudian lines more or less, and is well written and well arranged. But though Dr. Wechsler begins by noting the ill-defined character of his subject we can find nowhere in the book any attempt to define it. We miss any exact account of what neurosis is actually taken to signify. The author considers occupation neurosis a "hysterical conversion phenomenon," and we must suppose he thinks the same of the "cramps" of watchmakers, milkers, blacksmiths, tailors, flute-players, and so forth, since they are mentioned in the same section. Then how does he explain their monosymptomatic character? On the other hand, he entertains doubts of the "neurotic" nature of tics, torticollis, spasms, and myoclonus, seemingly because of the advent of epidemic encephalitis and recognition of dystonia musculorum deformans. He does not appear to have faced the question of similar clinical phenomena being of diverse and distinctive ætiology; torticollis, for example, looks the same outwardly whether it is a tic, a spasm, a paralytic modality, an occupation neurosis, a sequel to encephalitis, or what not. Again, impotence is taken to be a neurotic manifestation, especially of hysteria. But unless neurosis is defined the reader is no wiser. Impotence is neither more nor less than a symptom; it may be the expression of a number of entirely different factors acting on a physiological mechanism; among these, no doubt, is one that is psychical, but there are others.

The symptom itself is the same for all—viz., inability to perform the sexual act. In our view confusion results inevitably from any failure to realise that one and the same symptom can arise from disorders at different physiological levels—inclusive (if it be allowed, as it ought to be) of the psychical.

LEPROSY.

Symptoms, Diagnosis, Treatment and Prevention. Second (revised) edition. By ROBERT G. COCHRANE, M.D., Ch.B., M.R.C.P., D.T.M. & H., Secretary, British Empire Relief Association; Hon. Medical Adviser, Mission to Lepers. With a Foreword by Sir LEONARD ROGERS, M.D., F.R.C.S., F.R.S. British Empire Relief Association. 1930. Pp. 68. 2*s.*

IN a small compass this is a succinct and intelligible summary of modern knowledge about leprosy. In some eight short chapters the lesions, course, signs and symptoms, diagnosis, prognosis, prevention, and treatment are described. It is the last section to which the reader will undoubtedly turn for help, and here he will find the various methods of treatment, drugs, and dosages judiciously and helpfully set out. More than this, the author has studied his subject so diligently tha the is able to supply indications and contra-indications for each course advocated. We are glad to find in him no blind advocate of any particular line of treatment, but one who assigns to each a particular sphere of usefulness. A series of appendices giving details of staining methods and serological tests completes the volume. No worker in leprosy should be without this vade-mecum, which is a testimony in itself to the work of the British Empire Leprosy Relief Association.

BODILY CHANGES IN PAIN, HUNGER, FEAR, AND RAGE.

Second edition. By WALTER B. CANNON, M.D., S.D., LL.D., George Higginson Professor of Physiology in Harvard University. London: D. Appleton and Co. 1929. Pp. 404. 12*s.* 6*d.*

IT has often been asserted that physicians, apart from neurologists and psychiatrists, pay little attention to the effect of the emotions upon the body, either in health or in disease. It is doubtful whether this charge could ever be justly brought, but it is certain that at the present time no one in the medical profession or out of it is unaware of the influence which the mind and the emotions may exert upon bodily processes. The general public is, in fact, only too ready to believe in "miracles" achieved by faith-healing in one form or another. Prof. Cannon gives an account of the influence of the emotions upon the body, limiting his facts to those which up to the present have been experimentally ascertained. Since 1915, when the first edition of his book appeared, a large amount of work has been done, both in America and in Europe. The early chapters of the book, dealing with the effect of the emotions upon digestion, upon adrenal secretion, and upon the blood-sugar, are, apart from the inclusion of the newer work just mentioned, for the most part unchanged.

The most noteworthy additions to the second edition are two chapters dealing with the theory of the emotional mechanism. In the first of these new chapters Prof. Cannon deals with the James Lange theory; little in that theory commends itself to him, though when discussing expressed emotion in experimental animals, he admits that "we have no real basis for either affirming or denying the presence of 'felt emotion' in these reduced animals." It is, naturally, the "felt emotion" with which we are principally concerned, so that it is permissible to doubt the value of experiments on animals when this "felt emotion" is in question. The theory which is here developed to replace the James Lange theory is based on the clinical work of H. Head and others, and upon experimental work (again upon animals) in Prof. Cannon's own laboratory. According to this theory, the optic thalamus is the centre in which emotional processes are localised. Other new chapters deal with the emotional derangement of bodily function, the physiology of thirst, and with the recent work upon the part played by the spleen in emotional polycythæmia. The book concludes with an appeal for the satisfaction of the fighting instinct by some means other than war, and the suggestion is put forward that the only outlet suitable to the conditions prevailing in a civilised or semi-civilised world is to be found in international athletic contests.

HEAT PYREXIA. NO HEATSTROKE. NO HEAT FEVER.

By C. J. MCCARTIE, M.D., M.Ch., Lieut.-Colonel, I.M.S. (retired). Dublin: Browne and Nolan, Ltd. 1930. Pp. 27. 1*s.*

IT is very difficult to discover the object of this little tract, for it is little more. It is a wandering statement purporting to show that there is *no heat fever, heat stroke or sun stroke*, but as to what other to substitute for these well-hackneyed terms the author is quite unconvincing. The last fatal illness of a well-known surgeon is detailed, and no other explanation is advanced than that of a clear case of heat stroke.

L'ÉPILÉPSIE.

Conceptions actuelles sur sa pathogénie et son traitement. By Ph. PAGNIEZ, Physician to the Hôpital Saint-Antoine. Paris: Masson et Cie. 1929. Pp. 199. Fr.26.

THERE is no better expression than the French "mise-au-point" to exemplify in a word the general purpose of this new monograph on the ancient topic of epilepsy. Dr. Pagniez, roaming over a literature, old and modern, of incredible abundance, has aimed at selecting what seems to be of significant value from the double standpoint of pathogenesis and of treatment. In respect of the former, we cannot say that he has succeeded in closing discussions that seem interminable, but he has accomplished a useful and laborious task in presenting the reader with a clear description of rival theories and in underlining what in his opinion merits attention. Through his mind various hypotheses have been submitted to critical sifting as far as their evidential bases are concerned, and in this sense he has lightened the work of the newcomer to the study of epilepsy. Apparently Dr. Pagniez is impressed by the researches now in vogue which bear on the chemical, biochemical, and humoral side of the subject, and we are not sure that he has presented the arguments for the neural or neurogenic view as favourably as might have been done. Still, those who read his book with mental detachment must allow that a unitary explanation of epileptic pathogenesis is scarcely admissible so far as contributory factors are concerned, even though the crux of the interaction of vascular and neural elements remains. The treatment of epilepsy is open to the criticism of being incomplete. Every practitioner must have been conscious of this imperfection at one time or another; if he forcibly reduces seizures by strong sedatives he is aware of the essential crudeness of the proceeding; if he is delighted by operative success along surgical or humoral lines he cannot deny their inapplicability to other instances of the affection.

When all is said, it is something to know that the road is being cleared for further systematised attack on these difficulties, and Dr. Pagniez undoubtedly helps to show the way.

WOOLWICH MEMORIAL HOSPITAL.—An annexe to the maternity ward and a bed, endowed by the London committee of the Remembrance League, were last week accepted and handed over by the Duchess of Atholl, who also unveiled a commemorative tablet. The hospital was built two years ago at a cost of £250,000.

THE LANCET.

LONDON: SATURDAY, MARCH 8, 1930.

PROTECTION AGAINST MEASLES.

CONVALESCENT measles serum is being widely employed throughout Europe and America and, as we are reminded by Dr. W. A. LETHEM,[1] in many places steps have been taken to organise the supply and distribution of the serum, while in some it is scheduled in the local enactment corresponding to our Therapeutic Substances Act, so that the sterility of the prophylactic may be guaranteed. In this country the method has not been widely applied outside certain of the infectious and children's hospitals, and this is almost entirely because of the difficulty of getting supplies of the serum. Even in hospitals this difficulty may be acute, for it is not always expedient or practicable to take blood from the small children who form the bulk of measles patients, whilst adults, somewhat scarce in hospitals and fresh from a sharp illness, cannot always be persuaded to be bled for the benefit of all and sundry. The results of the schemes started in some of the London boroughs to secure supplies from adult measles patients, treated at home and brought to the notice of the health department by the practitioners, will therefore be awaited with interest. The suggestion has been made, and there is much to commend it, that the chance of such schemes succeeding would be increased by payment of the donors. Such payment need not involve great expenditure to the health department, which could recoup itself by making a charge for the prophylactic dose. But even with careful management, and alertness in finding sources of supply, it is doubtful if a reserve could be maintained sufficient to meet the current needs of epidemics so widespread as measles. Fortunately, the supply of donors of this precious commodity is not limited to those who have recently passed through an attack of the disease. The solid immunity engendered by an attack of measles is reflected in the rarity of second attacks, and there is little reason to doubt that this immunity is the result of the persistence of antibodies well into adult life. This fact was taken advantage of by DEGKWITZ[2] as long ago as 1920 in the production of passive immunity to measles by the injection of serum from adults who had previously suffered from the disease, and his observations have since been confirmed by various investigators. This important fact had apparently become submerged, but we now have timely reminder of it by the appearance of reports from Dr. E. H. R. HARRIES,[3] of Birmingham, and two pædiatricians of Philadelphia, Dr. A. E. SIEGEL and Dr. H. ERMANN.[4]

Dr. HARRIES's report is the more circumstantial, and the details are of considerable interest. A supply of pooled serum was obtained from 11 or 12 probationers who had a definite previous history of measles in childhood, and was put up in 10 c.cm. doses. Fourteen susceptible children each received a dose on the seventh day following exposure to measles, and two developed attenuated measles after a long incubation period. In three other exposed ward populations a similar procedure was adopted on the day after exposure, but no measles occurred among the 40 children injected. One of the exposed patients, however, had been removed from one of the infected wards on the day of exposure, but on account of having a previous history of measles did not receive an injection; as evidence that the exposure was effective it is noted that this child developed measles. Further injection of the contacts of this case on the day after exposure was followed by no further appearance of the disease. Dr. HARRIES, in his inference that the pooled adult serum was the predominating factor in suppressing these outbreaks, rightly stresses the importance of the attenuated cases. The Philadelphia work relates to an experiment carried out in a home in which there were 100 children. Measles appeared, affecting 10 of these between March 24th and April 11th, 1928, and two batches of 35 and 20 children unprotected by a previous attack were given 5 c.cm. of a pooled adult serum obtained from the parents with a definite history of measles on April 15th and 22nd respectively. The first batch contained those in closest contact with the cases and the youngest inmates. No further case of measles developed although the children went on attending schools in which the disease was epidemic; but rubella appeared between April 23rd and May 1st in 18 children. Of those developing rubella, 10 had received the serum, 6 had not, while 2 were among the original cause of measles occurring in the institution. Whilst it is difficult to evaluate the results of this experiment because of the outbreak of rubella—some of the cases of which in the injected patients may have been modified measles—and also because the adult serum was given late in the exposure, and in smaller dosage than that hitherto considered necessary for protection, there can be little doubt about the efficacy of the serum in Dr. HARRIES's experiment.

The importance of this work lies in the fact that it brings the sero-prophylaxis of measles within the range of measures practicable to the family doctor, for one or other of the parents is almost certain to have had measles, and thus a donor is immed
available. Further, as F. L. BIVINGS[5] has p
out, a parent would always be willing to give
for his own child, and no Wassermann re
should be required. The operation could be re
to its simplest dimensions by the practitioner
drawing 20 c.cm. of whole blood from the
basilic vein of the parent and injecting it
intramuscularly or subcutaneously into the
was intended to protect. It is true that
injection of whole blood produces a hæm

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[1] Medical Officer, Feb. 8th, p. 61.

[2] Zeit. f. Kinderheilk., 1920, xxv., 134.

[3] Medical Officer, Feb. 15th

[4] Amer. Jour. Med. Sci., Februar

[5] Southern Med. Jour., 19

undergoes absorption in the ordinary way, and it is not to be supposed that temporary æsthetic objections would over-ride the solid benefit obtained by protection against measles.

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DOCTOR AND PATIENT.

Is the doctor to be the sole judge of the number of visits which the patient should receive? To this question, as indeed to many others, the law seems to answer "Yes and No." A patient underwent an operation which, in view of his general health, was serious; he was three weeks in a nursing home, and apparently left it contrary to the doctor's orders. Sued at the West London County Court for the balance of fees due for professional services, the patient said he had expressed the desire that the doctor should not call so frequently. His Honour Judge Hargreaves did not accept this as a valid defence. "It must be for the doctor," he said, "to decide how often he ought to see a patient." At some stage of the convalescence, the personal relations between doctor and patient ceased to be entirely happy. The patient then wanted to see less of the doctor; he did not actually terminate his contract with the doctor, but he said he was willing to take the risk of reduced attendances. As the learned judge observed, the personal relations between the parties had nothing to do with the matter so long as the professional relationship of doctor and patient continued. The doctor had not chosen the patient; the patient chose the doctor.

At this point the law has satisfactorily answered "Yes" to the question whether the doctor is the sole judge of the number of visits to be paid. Common sense would agree. It is sometimes said that a man who is his own lawyer has a fool for a client; a man who is his own doctor is in much the same position. The contract between doctor and patient is an implied contract; the doctor is to render professional services and to receive reasonable remuneration. The contract must surely assume that the rendering of skilled services is not to be obstructed by the patient's pique or perversity. Though the patient can break off the contract entirely, he can hardly dictate the manner of treatment while the contract endures. But, having answered "Yes," the law now adds "and No." Judge Hargreaves, who has already laid down that it must be for the doctor to decide how often he ought to see a patient, deducts five guineas from the plaintiff's claim because "I have come to the conclusion that after March 7th attendances might have been fewer than they were." The patient had said so, and the patient, it seems, knows better than the doctor after all.

Nor is this the end of our perplexities. According to His Honour's judgment, after the patient had intimated that he was prepared to run the risk of fewer attendances, "the doctor could then, to cover himself, have written a letter to say that the risk of less frequent attendance must be borne by the patient." The purpose of such a letter, presumably, is to furnish prospective evidence for some subsequent tribunal. If the doctor reduces his attendances and the patient dies, the doctor will be able to flourish a copy of the letter in the face of the coroner. Or if an action of negligence is instituted, with allegations of carelessness and inattention, the letter may again be useful. But medical practice cannot be conducted in an atmosphere of lawyers' letters. The doctor must have a free hand in rendering professional service; he does not ask for more than the lawyer himself would claim.

THE EVOLUTION OF IMMUNITY.

The capacity to develop antibodies in response to the stimulation of an antigen is shown to any considerable degree only in birds and mammals. Cold-blooded vertebrates and invertebrates may occasionally be found to give a weak reaction, but there seems no reason to doubt that the antigen-antibody reaction, as we know it in the higher animals, is a comparatively recent achievement of evolution, phagocytosis being the fundamental method of defence which is found throughout the whole animal series. Correspondingly, it is doubtful how far individual acquired immunity plays a part among the lower animals in maintaining the different species against their several parasites. It seems possible to immunise the caterpillars of certain moths against bacterial infections by inoculating them with dead bacilli, but as far as we know the immunity of invertebrates is generally a racial immunity achieved by selection among populations with high capacities for rapid multiplication of the resistant survivors.

This evolutionary history is to some extent recapitulated in the development of the individual as is pointed out by Dr. E. Grasset in an interesting paper.[1] Chickens in the egg, which are very susceptible to the poisonous action of unmodified diphtheria toxin, show no response to repeated doses of toxin detoxicated with formalin (anatoxin), nor does this treatment enhance their capacity to respond to doses of the antigen given after hatching; they neither develop antibodies nor do they become immune. New-born chicks also have little aptitude for active immunisation and their capacity to respond to an antigen appears only after many weeks; adult fowls respond quite well. Young rabbits and guinea-pigs show the same relative incapacity and new-born infants also respond badly to, for instance, diphtheria anatoxin. In the natural course embryos seem to have no chance of learning the antigen-antibody response, because the placenta is not permeable to foreign proteins. This state of affairs would obviously land new-born mammals into a disastrous predicament on their arrival into a parasite-infested world, if no way round had been discovered. New-born children are in fact more resistant to infectious diseases in general than they are a year or two after birth; this protection is obtained by passive immunisation with their mothers' antibodies. This transference may take place across the placenta which, in man, is permeable to antibodies; the fœtus of a typhoid-infected woman may contain typhoid agglutinins. But in other animals (cow, sheep) antibodies will not pass through the placenta, and they are transferred from mother to young by the milk and especially by the colostrum. In adults the oral administration of antitoxins is idle; they are destroyed by digestion and are not absorbed except perhaps in minimal traces. By a merciful dispensation the alimentary tract of new-born animals is permeable to antibodies for a few days after birth, and during this period the young get enough to tide them over till they have developed the ability to make their own. As Theobald Smith showed, the infectious mortality among new-born calves is dreadful if they are prevented from having their normal quantum of colostrum; the mother's blood does equally well.

More recently T. Dalling has demonstrated how effectively lambs may be protected against *Bacillus welchii* infection, which is the basis of lamb dysentery, by vaccinating the mothers with *welchii* toxin; the antitoxin made by the mother is passed on to the lamb in the milk during the first day or two of life while its alimentary tract will absorb it. Similarly, Dr. **Grasset** suggests that in the East and in certain parts of South America, where the neonatal mortality from tetanus may be as much as 20–30 per cent., it would be worth while to inoculate pregnant women with formalised tetanus toxin.

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[1] Publications of S. African Inst. for Med. Research, 1929, iv., 171.

MODERN INDUSTRY AND SCIENTIFIC METHOD.

Modern industry is built on foundations of scientific research devoted to improving the technique of production. Process after process comes into existence in the ever-elastic capabilities of the human race; variety and complexity ever increase and demand proportionally greater intelligence among the workers. Monotonous repetition processes are but temporary expedients until ingenuity has developed machinery to supplant the human hand, and the intricate accuracy demanded to-day from skilled operatives has never before been approached in the history of the race. Thus has industry developed; thus must it continue to develop, if it is to serve faithfully the community to which it owes its existence. And that community which can best supply industry with the intelligent service which it needs must ever move in the van of progress, or, failing, fall back. More and more is it being perceived that the supply of this intelligent service cannot be left to fortuitous circumstance, but that organised research must be devoted to its up-keep. Thus a new science to-day is springing up aimed at detecting both the capacities, needed by industry, innate in each, and the environment of work which is best suited to the exercise of these capacities.

The economics of high wages have driven America forward in the study and practice of this young science, so that both worker and work may be worth the wages paid. In our own country, where modern industry was invented, we are becoming fully aware of the national importance of, and even need for, similar intensive consideration; but our knowledge, founded on research, is decidedly ahead of practice. Two bodies are interested in this situation and are working in close collaboration—i.e., the National Institute of Industrial Psychology and the Industrial Health Research Board. The Board is an official body, the outcome of a war-time perception that industrial health is the basis of national productivity; its efforts are directed to elucidating the principles which guide the human factor in industry. The Institute is a separate concern, paying its way from fees received for services rendered to industrial establishments, but making no profits. It enables individual firms to benefit from putting into practice new knowledge. The work of the Institute during the past year, as gathered from an interesting report for 1929, just issued,[1] includes careful investigation of various industries, and makes many suggestive recommendations for their improvement. The investigators aim at reducing the cost of output by improving machinery, lighting, and the arrangement of workshops, and by distributing the work in such a way as to diminish the fatigue of the workers. Expedition in the work of the coke-loading department of a gas-works has been attained by the employment of an emergency gang of workers which can be summoned at short notice, by an improvement in the type of loading mouthpiece used, and by provision for quicker communication between the heads of departments concerned. In a railway service advice has been given on the improvement of illumination and drainage, and on better methods of storage; changes in the work on automatic lathes have been introduced, which have reduced the costly waste of oil. In some lead works, and in a textile machinery factory, transport was the main problem; in the first case it was expedited by the use of mechanical methods of loading, and in the textile machinery factory a reduction of 40 per cent. in costs was obtained by reorganisation of the transport service under an office and foreman, by some structural alterations in the building, and by the provision of a bonus system for the workers. The introduction of "rest pauses" has been effective in increasing the output in some industries, and in cases where skilled labour is employed schemes to reduce the labour turnover have been put into operation, with good results. The investigations of the Institute have been carried on in cotton doubling mills, telephone and cable factories, cutlery factories, radio and chemical works, iron foundries, and the General Post Office, usually with a resulting increase in efficiency.

Vocational guidance of workers by advice based on psychological tests is still in an early stage of its development, though the members of the Institute place an increasing reliance on the results. During the past year a large number of "performance tests" have been devised which can be applied without the intervention of oral or written language. Some of these appear to have been of value in estimating calmness under pressure, perseveration, and other mental characters, but the Council of the Institute, in the annual report, stresses the need for further research. The value of using tests carefully selected for disclosing aptitudes when engaging new workers is shown. In one case labour turnover, that bugbear of employment, fell from 28 to 15 per cent.; in another case turnover, due to unsuitability, fell from 20–25 per cent. to 1–5 per cent., while the cost of training in the factory was reduced from £31 per head to below £5. In a haulage employment factory we read of movement studies of the processes involved in the preparation of raw material which resulted, from improved working methods and reallocation of workers, in an increase in output of 33 per cent.; we learn of organisation in the polishing and stropping of razors increasing output by 78 and 28 per cent. respectively; of £1600 saved per annum in the interest on capital locked up in materials in process from studying the transport problems of a machinery factory; and of instance after instance where examination of working conditions enabled existing congestion, strain, and irritation to be abolished. Meanwhile, research is being pursued in the vast field of vocational guidance and selection. For example, the after-careers of 1200 London school-children are being followed up; in certain rural and urban schools in Fife the growth of abilities in 472 children between the ages of 11 and 14 is being tested with special reference to choice of occupation after a survey of the local industries; while two other investigations are in progress in Birmingham, in one of which four groups of over 400 boys are being tested to detect innate aptitude for mechanical work. How best to mate the worker and his work is the motive of all these investigations, and the increase in output, brought about implies both better and cheaper production. A new impetus to the driving power of the eighteenth century discoveries is arising, an impetus coming from that right study of mankind—man.

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[1] Annual Report of the National Institute of Industrial Psychology for 1929.

Annotations.

"Ne quid nimis."

PHARMACOLOGICAL RESEARCH.

THE fourth annual report to be issued by the Pharmacological Laboratories of the Pharmaceutical Society of Great Britain is a record of valuable work divided, as in previous years, between research and the examination by routine methods of samples submitted by manufacturers. In the Pharmacological Department much of the work has been on problems arising out of the revision of the British Pharmacopœia. The extract of the posterior lobe of the pituitary gland has been investigated to determine how far the different properties of pituitary extract are present in the same proportions in different commercial samples, and the general conclusion reached was that it is not safe to infer the value of any property from the value determined for another property. Vasopressin and oxytocin, the two constituent parts of pituitary extract, have also been examined, and the fact that the antidiuretic and anti-insulin properties are almost exclusively possessed by vasopressin has been confirmed. It is curious that while it has long been the practice of many firms to submit tinctures of digitalis and of strophanthus for biological standardisation, it has not been the practice to submit samples of strophanthin. A series of commercial samples of strophanthin has been examined to determine their relative potency, with the result that out of nine samples the weakest had only 41 per cent. of the activity of the strongest. This is rather startling in view of the facts that strophanthin is intended for intravenous injection and that the dose is so small. It would appear to be much safer to employ the definitely crystalline glucoside ouabain, which is used as an international standard. The stability of extracts of ergot varying in strength from 35 to 75 per cent. has been tested; these extracts show a loss of activity on keeping so rapid that half the activity may be lost in two or three months even under the best conditions, while at low temperatures the loss is even greater. Concentrated extracts are more stable, but they also lose activity at a rate which appears to vary considerably in different samples. At the request of the Pharmacopœia Commission the toxicity of various commercial samples of tetraiodophenol-phthalein sodium (used for cholecystography) has been tested, the determinations being made by intravenous injection into the tail vein of mice. The dose of each preparation causing death of 50 per cent. of mice within three days was taken as a measure of the toxicity. This dose varied from 0·27 to 0·37 mg. per gramme weight of mouse in seven samples prepared by different makers. In the Nutrition Department some evidence was obtained of the existence of a further factor necessary for the growth of the rat; incidentally the unsuitability of the "vitamin-free casein" for use in tests for vitamin B has again been demonstrated. "Light white casein" should be used in basal diets composed for this purpose. Many observations have been made on the relation of vitamin A to the œstrus cycle, and on the variation of vitamin D in cod-liver oil and in irradiated milk. The number of publications, 17 in all, issued from these laboratories during the year, and their importance, indicate an activity of which the Director, Dr. J. H. Burn, and the Council of the Pharmaceutical Society may well be proud.

ABSCESS OF THE LUNG.

ON Feb. 25th the Section of Medicine of the Royal Society of Medicine discussed the *treatment* of abscess the lung, and various communications illustrated great advances in intrathoracic surgery to which R. A. Young the President, referred in his opening remarks. In skilled hands there is but little more danger in opening the pleural cavity, either for exploration or in order to deal with neoplasm or some suppurative condition, than in performing an exploratory laparotomy. An abscess in the lung may result from many causes, and if it is associated with gangrene, carcinoma, or other gross disease, the results of treatment must always be bad. In the single abscess, which is not infrequently seen after operation on the nose and throat, especially after tonsillectomy, the result of surgical treatment is very satisfactory. It is generally agreed that the best treatment when the abscess has once definitely formed and has failed to improve under expectant treatment is rib resection and drainage. It is essential, however, that the visceral pleura over the region of the abscess should be adherent to the chest wall, and for this reason the operation is usually performed in two stages, the first being to secure the adhesions. If this is not done pyothorax is likely to occur and add considerably to the gravity of the case. For the same reason exploratory puncture should be avoided in a case of abscess of lung and the abscess should be localised by radiography. Pyothorax is especially likely to occur if artificial pneumothorax is induced, and this is now considered to be dangerous and bad treatment except possibly in the case of an abscess situated near the root of the lung and communicating with a bronchus. Many cases of abscess heal spontaneously and in the early stages it is customary to treat the patient by simple medical means, but while it is difficult to judge when medical treatment should end and the surgeon should be called in, there is no doubt that these methods are often carried on far too long. The present policy of waiting to see whether the abscess is going to increase, become chronic, or heal seems unsatisfactory. Good as the results of surgical drainage are, one cannot help feeling that in many cases energetic treatment in the early stages would have prevented the necessity of any surgery at all. It is in the early stage, before adhesions have formed, that pneumothorax is comparatively safe and may prevent the abscess from spreading in the lung tissue. Aspiration through a bronchoscope has been practised in certain cases in the early stages, especially in America, and this method of treatment may lead to an early cure and has not the same disadvantages as artificial pneumothorax. Simple medical treatment so often fails to check the spread of the abscess in the lung that it is in this early stage that we may look for advance in treatment, either medical or surgical.

OCULAR LESIONS PRODUCED BY NAPHTHALENE.

AT a meeting of the Ophthalmological Section of the Royal Society of Medicine last summer the unusual spectacle was seen of a number of rabbits exhibited for ophthalmoscopic examination to demonstrate the ocular lesions produced by the administration of naphthalene by way of the stomach. The exhibitor was Miss Dorothy R. Adams, who publishes further details on the subject in the February number of the *British Journal of Ophthalmology*. The research was carried out for the Committee of Vision of the Medical Research Council at the Department of Physiology, University College.

Naphthalene cataract has been the subject of experiments in laboratories abroad for the last 40 years. Earlier observers were of opinion that it was entirely due to a disturbance in the ciliary secretion, but much investigation has failed to find any confirmation of this hypothesis. The first noticeable changes after the administration of an initial dose of 3 g. of naphthalene to a rabbit are usually what look like exudates and early peripheral lens striæ. On microscopical examination of the retina at this stage the affected areas in the retina prove to be localised patches of œdema without any albuminous or cellular exudates. The œdema of the retina is rapidly followed by atrophy, and in a week or ten days it may become detached with horizontal splits. Degeneration of other tissues of the eye follows. The changes observed in the lens agree with those described by previous observers. An initial swelling is followed by the formation of radiating striæ or fluid vacuoles at the periphery. In two or three days the lens fibres themselves become opaque, first in the posterior cortex and then in the anterior, the cataract becoming complete in about 14 days. A further phenomenon seen in two or three weeks as the result of repeated small doses of naphthalene is the deposition of crystals in the vitreous and anterior layers of the retina. With doses of 0·5 to 1·0 g. daily to a rabbit weighing 2 or 3 kg. or in certain animals of larger size with a daily dose of 3·0 g., these crystals are seen in two or three weeks, or in the case of the larger doses earlier. The crystals seen with the ophthalmoscope are very like synchisis scintillans. Chemically tested, they appear to be crystals of calcium oxalate. With these comparatively small doses the animals are always healthy and undisturbed by the naphthalene, the lens remaining quite normal. Even in the cases with the ocular lesions that result from larger doses the animals remain healthy as a rule, though a young animal may show toxic signs which occasionally cause death before the eyes are affected.

Taken together, the ocular lesions present features which suggest that they may all be due to a disturbance in the normal balance of the inorganic constituents of the body, rather than to any direct toxic effect of naphthalene or its derivatives. It is highly desirable that further research on the biochemical changes that may affect the structures of the eye may be continued, with a view especially to discovering any bearing they may have on senile cataract in man.

THE VITAMIN VALUE OF FOODSTUFFS.

A FULL index of foodstuffs, in which a numerical value for each vitamin is ascribed to each article of diet, could not be compiled on our present knowledge. At present it is not possible to make more than a rough grading, by using one to three crosses, as was originally done in the Medical Research Council's Report [1] on Accessory Food Factors. This was last brought up to date in 1924. Since then more knowledge has been accumulated, more foodstuffs have been tested, and the grading is somewhat more precise. Doubtless the new edition of the Report now about to be compiled will record these advances. Meanwhile a useful publication,[2] bringing the position up to date, has just appeared over the name of Sybil L. Smith, Senior Chemist to the Office of Experimental Stations, United States Department of Agriculture. This little handbook contains a very short, concise and accurate account of each of the vitamins and full tables of the vitamin values of foodstuffs, compiled from all available sources. It also includes a bibliography of the literature from which the tables have been made, and another bibliography of the technique of testing for each of the vitamins. Until sets of tables with numerical values can be put out, this pamphlet will be of the utmost value, not only to the scientific worker but also to all those who are responsible for planning dietaries, whether in institutions or in the home, whether for human beings or animals. The possibility of compiling tables with numerical values is not, perhaps, quite so very remote. The initial difficulty lies in the provision of a pure standard of constant biological activity, with which all unknown substances can be compared. It seems likely, for example, that a preparation of irradiated ergosterol can be made constant, and if so, a certain unit of the preparation should be able to supply a practical standard for vitamin D. Such a standard is, indeed, already in use by the Pharmaceutical Society of Great Britain in their vitamin testing department, and has been found to work well. As for vitamin A, if preparations of carotene of a certain degree of purity are found to have a constant value for biological activity, the provision of a standard here may be found before long not impossible. The other vitamins offer no such hope at present.

BACTERIOPHAGE AND LYSOGENIC BACTERIA.

IT has long been known that under the influence of the bacteriophage certain strains of bacteria develop which contain this principle in symbiosis. Some of these organisms undergo lysis and form worm-eaten or nibbled colonies, but others show no evidence of the associated bacteriophage except by their action on other species of bacteria. The nature of this stable condition, whereby organisms can harbour the lytic principle without themselves undergoing lysis, is of much interest. J. Bordet and F. Renaux [1] think it is dependent upon a balance between the bacteria and bacteriophage; a small number of the former are constantly undergoing lysis, and this maintains the activity of the principle, which (it is generally agreed) is only produced during the multiplication of the organisms. According to this view the resistance of the lysogenic strains is more apparent than real.

F. M. Burnet and M. McKie [2] have been studying such a lysogenic strain of *Bacillus aertrycke*. From the parent strain, which was rough and motile, they prepared the common rough and smooth variants, and found that whilst all of them were lysogenic for the test organism—*B. sanguinarium*—the rough types were generally much more active than the smooth. They further tested a very large series of the less common variants, comprising most of the variant types which have been described in the salmonella group, and here also they found that every type of variant was lysogenic. They accordingly conclude that the property of lysogenesis is a possession of each and every individual in a lysogenic culture and one of its essential properties. The fact that the R forms were the most actively lysogenic, whilst the particular phage showed no action on any rough strain of sensitive organisms is, they consider, an argument against the view that a non-detectable form of lysis is always going on in the lysogenic strains. They postulate that the phage, or its precursor, is present in every cell of the lysogenic strain of bacteria, and that it may be liberated during the process of growth. They find, however, that while it may be extracted by certain procedures from the non-multiplying cell it is not liberated by others which undoubtedly disrupt the cell. They assume that the difference depends upon whether the phage is present in an active condition or as an inactive precursor. By such a conception of a dual state they believe that the parasitic view of the bacteriophage can be reconciled with the view that it is a pathologically altered constituent of the normal cell. As such it remains latent, and is to be regarded as a component of the cell; but after activation and liberation—which appear to take place inside the cell—it shows its presence by a predatory parasitism on sensitive cells. This is the aspect which has been prominent in most observations.

Another interesting investigation of the bacteriophage has been made by I. Dresel and M. R. Lewis.[3] As is well known, large claims have been made by d'Herelle and his associates for the destructive powers of the bacteriophage upon bacteria in the body. A regular school of therapeutics has been built upon this effect. The resultant controversy has led Dresel and Lewis to study bacteriolysis in tissue cultures, in an endeavour to determine whether under these conditions infecting organisms can be destroyed by the lytic principle. Their results may be briefly summarised as negative. Neither in the presence of the growing cells of an animal peculiarly susceptible to the infection (mouse typhoid), nor in the presence of cells of an animal normally resistant to the infection, did the presence of added bacteriophage influence the noxious action of organisms upon the growing cells. In the case of resistant tissues the growth of leucocytes delayed the proliferation of the organisms, the liquefaction of the culture plasma, and the destruction of the culture; but this was an effect solely attributable to the type of tissue in use, and was in no way modified by the presence of bacteriophage.

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[1] Special Report Series No. 38.

[2] Vitamins in Food Materials. U.S. Department of Agriculture, Circular No. 84. November, 1929. For sale by the Superintendent of Documents, Washington, D.C. 15 cents.

[1] Ann. Inst. Pasteur, 1928, xlii., 1283.

[2] Austral. Jour. Exper. Med., 1929, vi., 277.

[3] Amer. Jour. Hyg., January, 1930, p. 189.

HOSPITAL MEETINGS AND HOSPITAL REPORTS.

AT this season of the year a large proportion of the provincial voluntary hospitals are holding the annual meetings of their supporters. The broad impression left by the proceedings at these meetings, and the more or less detailed accounts of their work during the past year, is one of abounding activity and improved finances. There are still, no doubt, many instances of expenditure exceeding income, but there are far more in which there are favourable, if usually small, balances. Looking at the rapid and severe growth of the pressure upon the hospitals, it is rather remarkable that there should be any surpluses anywhere, and their existence is not the least conclusive proof of the resilience of the voluntary principle. Almost suddenly the country has begun to acquire the hospital habit, and the realisation that hospitals are no longer merely refuges for the sick who cannot afford prolonged medical or surgical attendance, has, in more ways than one, created difficulties which are being courageously met. Thus the "pay bed" is rapidly becoming an institution, and the hospitals contemplating, or actually making, enlargements, are to be counted by the score. A few years ago the confidence with which huge expenditure in buildings and equipment are undertaken would have seemed almost criminal lightheartedness. But the pressure upon beds and out-patients' departments has got to be met if the whole system is not to break down. It could not possibly have been met had the hospitals still been dependent, in the main, upon voluntary subscriptions and upon endowments which, save in the case of a comparatively few great and old-established ones, are more or less negligible. The masses have been called in to redress the balance of the classes, whose help has, perforce, become almost stationary. Contributory schemes, with membership ranging from a few hundreds to many thousands, are arising on every hand, and, so far as we are aware, not one of them has failed in its object. Here and there a hospital board had held back from timidity, but it is a fairly safe prophecy that eventually nine-tenths of the genuine hospitals will derive a large proportion of their revenue from the pence of the working-classes. From the point of view of medical and surgical science, the information derived from these annual meetings is full of encouragement. Everywhere there is the same story of increased and improved equipment, and of the adoption of means, nearly always costly, of alleviation or cure, not primarily dependent upon drugs. Massage and radiological departments, and provision of the many varieties of electrotherapeutic treatment are demanded all along the line, and accommodation is being rapidly increased. The virtual unification of our hospital system is coming not a day too soon. The death of the poor-law hospital means new life for the voluntary hospital, because it means, to use the current shibboleth, something in the nature of rationalisation. To what extent the public assistance hospitals will relieve the pressure upon the voluntary institutions time alone will show, but we know enough to be sure that, for the present, at all events, the relief will not [illegible] be appreciable, but that it may reasonably be [illegible] to facilitate that specialisation which has hitherto been seriously limited by circumstances.

In view of the great changes that are about to occur, it is of increasing importance that all hospitals, large or small, general or special, should issue their detailed printed reports with far greater promptitude than hitherto. It is a duty which they owe to each other as well as to their individual supporters. Hospital management has become a science, and a comparative study of these reports is of real practical value. The system of hospital accounts has been standardised, and something more in the nature of the standardisation of information is highly desirable. The cost of beds and of patients' maintenance in two, or half a dozen roughly comparable hospitals, may and does differ, and managers and secretaries may well be anxious to ascertain why the cost is greater in one case than in another. A study of these reports should help, but the help will be minimised if the information, when it becomes available, is six or more months in arrear. Stale statistics are often misleading, and hospital comity demands that the interchange of such-like information should be not only lucid but prompt.

GRASSUS ON THE EYE.

THE little text-book on the eye by Benevenutus Grassus of Jerusalem, which Dr. Casey Wood has translated,[1] was for more than 400 years the most popular of ophthalmic manuals. When the first manuscript was written, and in what language it was composed, is not definitely known, but the earliest manuscript existing is the thirteenth century Provençal codex now in the library of the University of Basel. Dr. Casey Wood states that there are about 40 texts extant, 22 in manuscript and about 18 printed editions. The Ferrara edition (1474 A.D.) ranks among the true incunabula. The exact date of publication may be a matter for dispute, but Dr. Casey Wood advances convincing arguments for placing it in 1474. Curiously enough another work with an ophthalmological title—the *de Oculo Morali* of Archbishop John de Peckham—was published by Anton Sorg, of Augsburg, in the following year; this latter work makes no pretence to being a practical ophthalmic manual. Peckham was a noted mathematician, possessed of a knowledge of optics, considering the age in which he lived, unsurpassed save by that of his fellow Franciscan, Roger Bacon; but Peckham was not a medical man and in the *de Oculo Morali* the eye serves "as a peg on which to hang saintly saws and religious dogmas."

No one can read this little book by Grassus without realising that it is a really practical work; regard is continually being paid to the general condition as well as to the local ocular state, and clear rules of regimen are laid down when these are indicated. In those early days the only surgical treatment for cataract was couching; Grassus distinguished seven kinds of cataract, of which four were curable and three incurable, and he reminds his readers that if any are so minded as to attempt a cure in unsuitable cases they will labour in vain. In couching, the advice is given to depress the cataract from the pupil, pushing it well down and holding it down "until you have said four pater-nosters." Under the title "scabies of the eye" a good description is given of trachoma, the mechanical ptosis being noted; on everting the upper lid the inner surface is found to be thickened, "with granular deposits in its substance like grains of millet." In the treatment of this condition, after a suitable purge, we are told to "evert the diseased lid and squeeze out the fleshy growths with the fingers, aided by the knife, attacking first the parts towards the inner canthus, finally removing all the granulation tissue beneath the lids. Then place cotton-wool moistened with white of egg on the eye as a dressing for fifteen days, after which my *emplastrum gratiosum* should be applied twice a day for three days. The patient may then open his previously useless eyes." The use of the Alexandrine collyrium completes the cure. It is interesting to find that Grassus recognised the connexion between *muscae volitantes* and black bile. This work also contains a good account of pterygium and its surgical treatment. The topical applications seem for the most part to be bland and unirritating; the nasty messes which formed so great a part of the therapeutic armamentarium of the Middle Ages are absent, and there is no reason why Grassus's apple poultice should not be as good an application for a stye as many other dressings which have been recommended in modern times. Only eight copies of this 1474 edition of the work appear to exist; three are in America, the Pierpoint Morgan copy having been bought from an English sale as recently as 1905; four copies are on the Continent, two in the Bibliothèque Nationale at Paris, one each at Rome and at Naples; and one copy is in the library of the Royal College of Surgeons of England. The facsimiles of pages of the Ferrara edition, the Provençal codex, and the Ashmolean Old English codex in the Bodleian Library, add greatly to the interest and value of the book.

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[1] De oculis eorumque egritudinibus et curis. Translated, with notes and illustrations, from the first printed edition, Ferrara, 1474 A.D., by Casey A. Wood, M.D., LL.D. California: Stanford University Press. London: Humphrey Milford, Oxford University Press. 1929. Pp. 101. 23s.

Dr. Casey Wood deserves praise for his translation and for the valuable footnotes identifying the various herbs in use, as well as for his learned preface. The type, paper, and format of the book are beautiful.

POST-VACCINAL ENCEPHALITIS.

REPORTS on post-vaccinal encephalitis in Germany and Sweden are published in the latest *Bulletin d'Office Internationale d'Hygiène Publique* (December, 1929, p. 2052). In the former country during 1927, 1928, and the first nine months of 1929 51 probable cases have been discovered. In these three years the numbers were 16, 21, and 14 respectively and the total mortality was 22. The time of onset after vaccination agreed with the experience of other countries with the maximal incidence on the eleventh day. Forty-six of the cases, with 17 deaths, occurred after primary vaccination and over a million persons were primarily vaccinated each year. Eight cases with four deaths were in children under one year old, and 18 with five deaths between the ages of 1 and 2. It is stated that most children are vaccinated before they are two. In the three years only five cases followed revaccination at ages of 12 to 14 years and all died, but in two of them no trace of primary vaccination was visible, and three of the five were not certainly cases of the disease in question. The revaccinations of children at 12 years during this period were about four million. Most cases occurred in May, June, or October, the numbers being 21, 8, and 6 respectively, and there was no apparent tendency to aggregation of cases into special districts. The figures thus confirm former observations on the rarity of post-vaccinal encephalitis after revaccination and the complication is once more seen to be relatively uncommon when primary vaccination is performed under the age of one. An inquiry in Sweden made in 1929 retrospectively by C. Kling, N. Lönberg, and E. Wassén discovered 20 possible cases, with five deaths during the years 1924–28. These were distributed as 3, 2, 2, 4, and 9 during the five years respectively, and occurred in the proportion of 4·7 per 100,000 vaccinations. Of the 20 cases, seven were believed to be probably not post-vaccinal encephalitis. In the first six months of 1929, following a special request to practitioners, four cases were notified among 45,000 vaccinations. One of these, with onset on the eighth day after vaccination, was probably poliomyelitis and survived with persistent paralysis. Two cases in boys of 6 and 7 years with onset on the twelfth and thirteenth days after vaccination died, and the fourth case occurred in an infant of 7 months, who had convulsions and opisthotonos on the thirteenth day after vaccination but appeared well next day. The post-mortem and histological examinations of the two fatal cases are stated to have shown the typical appearances of post-vaccinal encephalitis. The authors, however, describe rounded or oval bodies, resembling protozoa, in the brain, which they believe to be the causal agent. Cultures gave negative results and animal experiments are now in progress. These "bodies" do not appear to have been seen by the many other pathologists working at this disease. Kling and his colleagues state that during the five years in which the 20 cases of post-vaccinal disease occurred, 32 cases of meningo-encephalitis have been observed following measles, 12 after whooping-cough, 7 after mumps, and also 969 cases of epidemic encephalitis. They consider the evidence is in favour of post-vaccinal encephalitis being due to the lighting up of an infection with a hitherto undescribed micro-organism.

W. Knoepfelmacher[1] gives a valuable review of the whole subject of post-vaccinal encephalitis and discusses critically the various views of its ætiology. The suggestions that the infection is due to vaccinia virus alone in persons of special predisposition, that it is essentially due to the virus of poliomyelitis, encephalitis lethargica, or herpes, either already present but latent, or predisposed to by vaccination—all these present very serious difficulties. A hypothesis that the encephalitis is rather an allergic phenomenon than an infection has very little to support it. The tendency for aggregations of cases to occur in some districts or communities is noticeable. The view which is least at variance with the facts is that put forward in the report of the Rolleston Committee, and by others—namely, that vaccination arouses into activity an infection with a latent unknown virus, and that this virus may be the same as that causing similar inflammation of the central nervous system after measles, varicella, or mumps and in the cases of meningo-encephalitis disseminata described of late years. Knoepfelmacher's prophylactic recommendations are almost the same as those of the Rolleston Committee, with the addition that he suggests further trial of intradermal or subcutaneous insertion of the vaccine lymph.

In the same journal[2] O. Reisch describes a series of eight cases of acute nervous disease observed in the valley of a tributary of the Inn. They occurred among 233 children, aged 5 to 10 years, who had recently been primarily vaccinated. A characteristic symptom consisted of very marked frequent twichings, almost confined to the muscles of the trunk. Two of the cases ended fatally and the characteristic changes of post-vaccinal encephalitis were found in the brain. On examination of 300 children of the district similar myoclonus was found to be present in some degree in a large number, equally among the vaccinated and unvaccinated. Reisch points out that though the symptom was first noticed in cases of severe disease after vaccination it was really due to an epidemic of an independent affection of the central nervous system, but might not have been recorded except for the coincidence of vaccination.

It is of interest to note that Eckstein, Herzberg-Kremmer, and Herzberg[3] have been able to demonstrate the presence of vaccinia virus in the blood of recently vaccinated children—in 8 out of 14 primary vaccinations—especially between the sixth to eighth day after vaccination. The fact that vaccinia virus circulates in the blood and can be recognised with difficulty was already known, as well as the much lesser frequency with which it can be detected after revaccination. Eckstein and his colleagues also sought for the virus 19 times in the cerebro-spinal fluid, but it was only found once, in a case of post-vaccinal encephalitis.

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[1] Wien. klin. Woch., Jan. 23rd, p. 97.

[2] Ibid., p. 103.

[3] Deut. med. Woch., Feb. 14th, p. 264.

THE INFIRMARY OF THE MEDIÆVAL MONASTERY.

In the course of a lecture delivered at University College, London, on Feb. 21st, Mr. Percy Flemming pointed out that the monastic infirmary was primarily for the use of the old and infirm monks and was not a hospital. It was recognised, however, that the monastic life might be responsible for what to-day would be called functional nervous trouble. Patients of this type from the monastic infirmary at Westminster, with which Abbey Mr. Flemming was specially concerned in his lecture, were sent to take the air and walk in the meadows at Battersea, Wandsworth, or Hendon. Among the more definite ailments from which the monks suffered, judged by the entries in the account books, a disease of the tibia seems to have been common—probably due to excessive kneeling. The cost of treatment for different patients shows that the severity of the cases varied greatly; in some cases it was 3*s.* or 3*s.* 6*d.*, in others 40*s.* for surgical attendance. (These figures should be multiplied by 15 to make them equivalent in value to our money.) As the Westminster monks had only two baths a year and did not completely undress on going to bed, the serious case may well have been due to infection of a simple abrasion. The infirmary was in charge of the infirmareis who was more concerned with administration than with medicine. In addition there was a medical officer who might live in and probably did so at Westminster. In 1351 the medical officer of health of Westminster was paid £2 13*s.* 4*d.* Periodical blood-letting was part of the monastic rule. The operation was usually followed by a short stay in the infirmary, where the patient enjoyed quiet and a better dietary. The water-supply of a monastery was usually taken first to the infirmary block. Westminster received its supply from the springs in Hyde Park, near the present Albert Gate. The last Abbot of Westminster was Feckenham. He wrote a book, which can be seen in the British Museum, under the title (written in his own handwriting) of "A book of sovereign remedies against the most common and known diseases, and that chiefly for the poor which had not at all times the learned physician at hande." This same Feckenham is known to have used his influence with Queen Mary at one time to save 28 victims from the stake. Mr. Flemming, from a survey of his attitude to sick persons and heretics, believes Feckenham to have been a kindly, sympathetic man, worthy of the honour of being the last Abbot of Westminster.

CHEMICAL WARFARE.

In the House of Commons this week Mr. Lawther called attention, by question, to the increased number of applications coming under the consideration of war pension committees where the sufferers attributed their condition to gas poisoning during the war. Reference in the question was chiefly to tuberculous patients, although allusion was also made to neurasthenics, and the object of the question, which was asked in almost similar terms on the same day by Mr. Shepherd, was to inquire whether a special commission could be erected to investigate the period at which, after the receipt of the original injury, tuberculosis might develop. The Minister of Pensions, Mr. F. O. Roberts, said the connexion of exposure to gas and the subsequent development of tuberculosis had been considerably investigated with results which did not justify the inquiry of the kind suggested, while he went on to remind the House, several other members having intervened in what became a short debate, that every individual case of this sort, where gas poisoning could be held to be precedent to the illness, had been and was being carefully considered, the benefit of the doubt being always given to the applicant. Undoubtedly, owever, ground can be made out for particular quiry, for there is evidence from French authorities that the delayed action of gas poisoning in relation to tuberculosis constitutes a real problem. That it should exist nearly 12 years after the Armistice gives weight to the fact that a large number of nations have welcomed the protocol prohibiting chemical and bacteriological methods of warfare. For on the same day, in the House of Commons, it was stated that the following countries have ratified or definitely acceded to the necessary convention: Australia, Austria, Belgium, Canada, China, Egypt, Finland, France, Germany, India, Italy, Liberia, New Zealand, Persia, Poland, Roumania, South Africa, Spain, Turkey, Union of Soviet Socialist Republics, United Kingdom of Great Britain and Northern Ireland, Venezuela, and Yugoslavia. Further, Denmark, the Netherlands, and Portugal intend shortly to ratify, while the United States of America, Czecho-Slovakia, Bulgaria, Japan, Norway, Sweden, Switzerland, and other civilised countries have already signed the convention, though ratification is still awaited from them. The position is, in fact, very reassuring.

APPLES FOR DYSENTERY.

Old popular remedies have a happy knack of turning up again, to the joy of sceptics, cynics, and other non-progressives. The latest revival is the use of apples in dysentery, typhoid, and other acute and chronic diarrhœal disorders of infancy and childhood. Prof. Moro,[1] professor of diseases of children in the University of Heidelberg, recently discovered in an old book that apples were reputed to be a sovereign remedy for these disorders, and set himself to determine what grain of truth might lie in this. Accordingly children with high fever and dysentery, often seriously ill, were given ripe apples mashed into a purée, as much as 20 to 50 ounces daily—equivalent to 7 to 20 moderate-sized apples. Nothing else was given for two days, not even water. After this a diet consisting of stale bread and butter, toast, mashed potatoes, lean meat, cream cheese, bananas, and cocoa was given for another two days, and then the child resumed its normal diet. Fifty-two cases—some frank dysentery, others of non-specific acute and chronic diarrhœas of childhood—were treated on these lines with excellent results; within 12 to 24 hours the fever had fallen, the diarrhœa had stopped, and the child looked well. No bad effect was observed; relapses were very uncommon, and when they did occur were easily cured by another "apple-day." No medicine was given.

Part II. of Mr. Bowdler Henry's article, "The Interpretation of Dental Radiograms" (a contribution to the Clinical Interpretation of Aids to Diagnosis), has been held over this week owing to the mechanical difficulty of reproducing the illustrations.

Dr. Maurice Alan Cassidy, physician to St. Thomas's Hospital, has been appointed physician to His Majesty's household, in succession to Dr. Herbert French.

Dr. Donald Hunter will deliver the Goulstonian lectures at 5 P.M. on March 11th, 13th, and 18th at the Royal College of Physicians of London, Pall Mall East, S.W. His subject is the Significance to Clinical Medicine of Studies in Calcium and Phosphorus Metabolism. Any member of the medical profession will be admitted on presentation of a card.

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[1] Klin. Woch., Dec. 24th, 1929.

A Somerset Hospital.—Mr. B. H. Hill recently laid the foundation-stone of a new wing of Paulton Memorial Hospital. The cost of its erection is being borne by the Miners' Welfare Fund.

Special Articles.

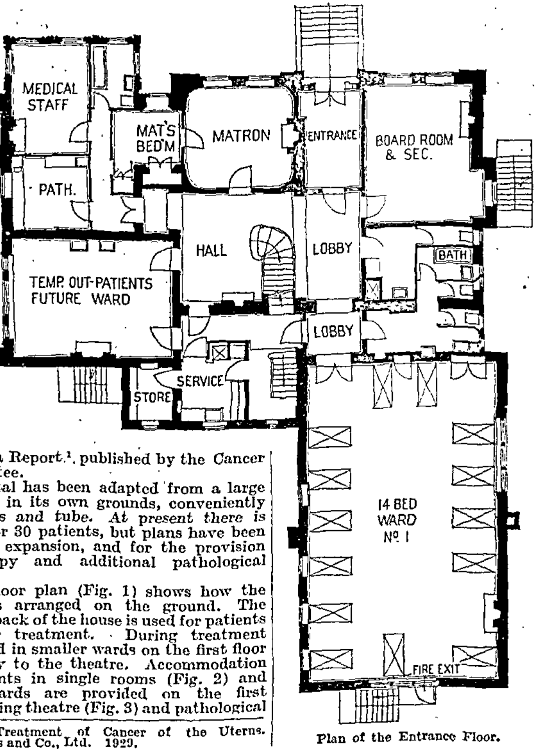
THE MARIE CURIE HOSPITAL.

NEW CENTRE FOR THE TREATMENT OF CANCER BY RADIUM.

THE systematic treatment of cases of uterine cancer by radium has been carried on by the Cancer Research Committee of the London Association of the Medical Women's Federation for over four years. The clinic as originally organised was attached to four hospitals—viz., the Royal Free Hospital, the South London Hospital, the Elizabeth Garrett Anderson Hospital, and the New Sussex Hospital, Brighton—but through the generosity of the public a new hospital, called the Marie Curie Hospital, was opened last August at No. 2, Fitzjohn's-avenue, near Swiss Cottage, London, N.W., *in order that the work might be centralised and* expanded. The four original hospitals still remain in active coöperation, and the staff of the Marie Curie Hospital is mainly composed of medical women holding appointments on their staffs.

Before the clinic began its work in 1925, a careful survey was made of the results claimed by workers at different clinics all over the world. This enabled a decision to be made on the technique to be adopted. In order that the method used might be tested thoroughly in a large number of cases, it was agreed that, while each surgeon should have entire charge of her own cases, the method and principles of treatment were to be settled by the staff as a whole on the advice of the Cancer Research Committee. An account of the inception of the work, of the progress made during the past four years, and of the arrangements for the future is given in a Report,[1] published by the Cancer Research Committee.

FIG. 1.



Plan of the Entrance Floor.

The new hospital has been adapted from a large mansion standing in its own grounds, conveniently accessible by 'bus and tube. *At present there is* accommodation for 30 patients, but plans have been made for further expansion, and for the provision of X ray therapy and additional pathological laboratories.

The entrance floor plan (Fig. 1) shows how the accommodation is arranged on the ground. The large ward at the back of the house is used for patients before and after treatment. During treatment patients are placed in smaller wards on the first floor in close proximity to the theatre. Accommodation for private patients in single rooms (Fig. 2) and double-bedded wards are provided on the first floor. The operating theatre (Fig. 3) and pathological laboratory are fully equipped, and there is a closely organised follow-up clinic.

The Organisation of the Staff.

The scientific advisory council of the hospital are Sir Walter Fletcher, Prof. E. H. Kettle, Prof. Sydney Russ, Sir Charles Sherrington, and Sir Cuthbert Wallace. The research work is carried out under the charge of the Cancer Research Committee, of which the members are Miss M. Chadburn (chairman), Lady Barrett, Miss E. Bolton, Lady Briscoe (secretary), Dr. H. Chambers, Dr. E. M. Magill, Dame Louise McIlroy, Miss L. Martindale, Dr. Kate Platt, and Dr. E. Hurdon, research officer and Director. The medical staff consists of 17 surgeons, five physicians, a Director, a pathologist, and a radiologist. All surgeons on the staff have the right to attend their own cases, irrespective of seniority. Patients not sent in under special surgeons are allocated to surgeons on a rota. The resident staff includes a house surgeon, an experienced matron, three sisters, and as many staff and assistant nurses as are required.

Admission of Patients.—Fees.

Patients are admitted through the out-patient or in-patient departments of the four hospitals mentioned above. Private practitioners who want their patients taken in may apply to any member of the staff, or direct to the secretary at the hospital. Patients may also apply direct to the hospital; and when they do so, the hospital authorities communicate with the private doctor, if there is no valid reason against such a course. A clinic is held every afternoon, in charge of a member of the staff, for diagnosing new patients and examining follow-up cases. Patients who present themselves while the clinic is in progress will be seen then, or will be told when to come again.

Patients in the general ward pay from nothing to 3 guineas a week, according to their means, arrangements being made through the Secretary. Private patients pay from 5 to 15 guineas a week, according to the room occupied. The surgical staff make their own arrangements with the patients regarding fees, and each pays one-third of the fee received to the hospital for the use of the radium, and arranges for the payment of other members of the staff—i.e., pathologist, anæsthetist, or radiologist.

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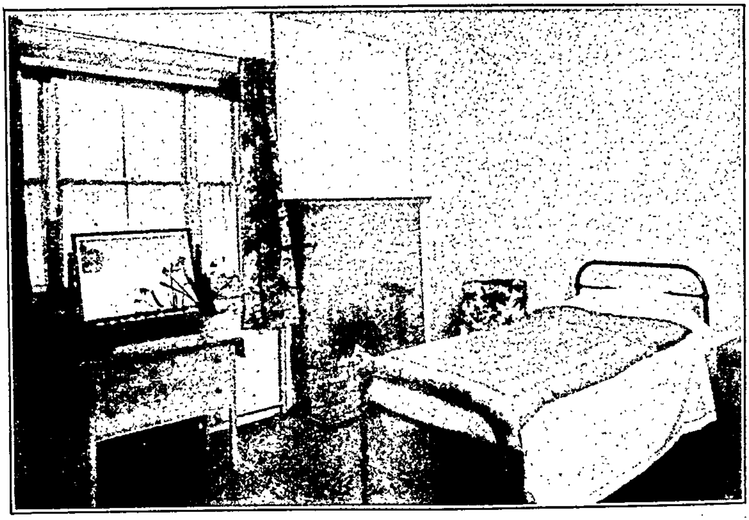
[1] The Radium Treatment of Cancer of the Uterus. London: H. K. Lewis and Co., Ltd. 1929.

Duration of Treatment.

Patients come in two days before treatment, and if not well enough for radium treatment are kept in hospital for tonic treatment. When they are fit, they have radium treatment, and remain in hospital during the following week; if there is no reaction or contra-indication at the end of this first week, the second application of radium is made. A day or two after this second treatment, if conditions are good and the patients are well enough, they go home for a fortnight, and then come back for a third treatment. They leave finally, if fit, about two or three days after this last treatment, and are instructed to attend the follow-up clinic when requested, Arrangements are made for district or private nurses to administer any after-treatment required, usually a douche. Subsequently patients are examined at regular intervals; if they do not respond to letters, they are followed up to their homes by competent investigators, who report to the Director. The Director then communicates with the patient again, and seldom fails to convince her of the need for periodical visits to the clinic.

Post-graduate Courses.—Special facilities can always be arranged for post-graduates requiring instruction in radium application. It is hoped to institute research scholarships, and courses of instruction are already being planned.

FIG. 2.



A Private Bedroom.

Some Results of Treatment.

Over 400 cases of cancer of the uterus have now been treated since the clinic was started in connexion with the four hospitals. The number of cases shown in the last annual report published in 1929 was 322. Only 68 of these could have been treated by surgical operation; the remaining 254 were quite inoperable. Of the operable cases 90 per cent. were free from all signs of cancer when last seen, and nearly all the inoperable cases were materially benefited. Some of them were free from symptoms for many months, some for two or three years. The final stages of the disease in the patients who died were, as a rule, accompanied by much less suffering, because of the absence of local septic conditions. In a few cases there was a recurrence of hæmorrhage shortly before death. Fistulæ, due to extension of the growth, were apparently less frequent than in cases untreated with radium. Death was usually from asthenia due to internal metastases; in four cases it was due to uræmia. Only one death occurred as a direct result of the treatment.

FIG. 3.

The Operating Theatre.

Statistics of the cases treated are being kept in the form advised by the Radiological Subcommission of the League of Nations, so that results can easily be compared with those from other centres in all countries. The first five-year period does not end till September of this year, but the results of a three and a half year follow-up period, though too short to justify deductions, are encouraging.

PARK HOSPITAL, DAVYHULME.—This great poor-law infirmary, near Manchester, was opened in June last by Princess Mary, but although there are 500 beds there were a month ago only 284 ordinary and 13 private patients. Dr. J. J. Butterworth, the medical officer for Lancashire, recommends that it should now be taken over by the county public assistance committee for use as a public hospital. The institution, which is at present under the control of the Barton-upon-Irwell Board of Guardians, and cost £376,000, has all the most modern equipment.

EXTENSION OF LINCOLN COUNTY HOSPITAL.—The Governors have adopted, as an urgent necessity, an extension scheme which, in its entirety, will cost £100,000. Immediate steps are to be taken to raise £45,000, so that the first section of the work may be begun without delay. In the last ten years the demands upon the hospital have nearly doubled, but in that period only 20 additional beds have been provided. The comprehensive scheme includes a new block of two wards containing 50 beds; a new out-patient and casualty department, the present one being greatly overcrowded; a new in-patient unit of 20 beds for eye cases, the increase of which is described as "enormous"; a new operation unit and a larger X ray department. There will also be a new pathological annexe, better accommodation for resident medical officers, and an enlargement of the nurses' home.

THE LONDON HOSPITAL: FREEDOM RESEARCH FUND.

A REPORT of work carried out during the year ending March, 1930, has reached us.

Filtrable Viruses.

Dr. S. P. **BEDSON**, Senior Freedom Research Fellow, has continued the study of filtrable viruses, the two main objectives having been (1) the possibility of cultivating these viruses in a lifeless medium; (2) an understanding of the factors concerned in immunity to virus infections.

Artificial Cultivation.—Although this work is far from complete, some interesting and encouraging results have been obtained. Herpes virus has been used throughout and a medium has been evolved in which this virus will survive for three to four weeks at a temperature of 30° C., whereas the control, consisting of virus suspended in a phosphate buffer, becomes inactive in 24 hours. Both the quality of the "takes" given by these cultures when tested at intervals, as well as quantitative estimation of their virus content, suggest that multiplication of the virus occurs. Evidence in favour of virus growth has not, however, been constantly obtained. The results to date are encouraging and at least as demonstrative of multiplication of virus in the absence of living cells as those reported recently by Muckenfuss and Rivers.[1]

Immunity to Virus Infections.—Much of this work has been devoted to a study of the interaction of virus and antibody "in vitro" using principally herpes virus. It has been shown conclusively that the two unite in the test-tube, and this observation led to a study of fixation of complement. Previous work had given negative and inconclusive results with this immunity reaction, but a satisfactory technique has now been evolved, and the results indicate that specific complement fixation can be obtained with viruses and their antisera. Some of this work has been carried out in collaboration with Dr. J. Bland. Dr. Maitland-Jones has undertaken an investigation of the relationship of the viruses of zoster and varicella by means of the reaction of fixation of complement, preliminary experiments having shown that the serum of zoster convalescents reacts specifically with the fluid obtained from zoster vesicles. The question of immunisation with killed virus has also received attention, and it has been found possible to produce a solid immunity in guinea pigs to herpes virus by means of formalised virus. The formalised virus could not be reactivated by serial passage in guinea-pigs.

The work of Dr. Bedson and his collaborators on psittacosis is familiar to our readers.

Nature of Diphtheria Toxin-antitoxin Floccules.

Dr. S. **CAMPBELL SMITH**, Freedom Research Fellow, has attempted to ascertain the nature of these floccules, mainly by the use of the spectrometer. It has been found that the floccules formed by diphtheria toxin and antitoxin closely resemble serum pseudoglobulin; the ultra-violet absorption curves of the floccules and pseudoglobulin are identical. The amount of protein nitrogen present in the floccules bears a quantitative relationship to concentration of toxin and antitoxin reacting in a balanced mixture. The presence of such substances as normal horse serum and lipoid material in the mixture does not alter the composition of the floccules. It is suggested that pseudoglobulin is the actual antitoxin and that antitoxin is not merely carried down by the protein.

A new photo-electric method of measurement has been devised, by means of which earlier findings on the ultra-violet absorption spectra of the serum proteins have been confirmed.

A pigment has been isolated from diphtheria toxin broth; from its property of fluorescence and from its characteristic absorption spectrum this pigment has been identified as a porphyrin. It fades on exposure to light, the toxin being destroyed at the same time. An attempt has been made to correlate the rate of formation of this pigment with the rate of formation of the toxin; so far, however, no relation has been demonstrated.

Complement Fixation with Vaccine Virus and Antisera.

Dr. J. O. W. **BLAND**, Freedom Research Fellow, has carried out a large number of experiments with virus grown in rabbit tissues (particularly brain) and rabbit sera prepared against such viruses. The results were frequently marred by non-specific reactions. Experiments with vaccinia grown in guinea-pig tissues and with antisera prepared in guinea-pigs have been more satisfactory; vaccinia virus used either in the form of suspensions of tissue, diffusates from tissue or vesicle fluid, has been observed to fix complement in the presence of antisera prepared against virus grown both in guinea-pig tissues and rabbit tissues, including brain. These reactions are specific in the sense that vaccinal antigens will not fix complement with normal sera or sera prepared against bacteria which contaminate the antigens, and that vaccinal sera will not fix complement with antigens made from bacterial contaminants, normal tissues, or tissues infected with herpes virus.

The non-specific reactions obtained when brain antigens are used and the failure of virus-brain antigens to fix complement with vaccinal antisera are being investigated.

Production of Immunity to Vaccinia Virus with Killed Vaccine.

Very little, if any, evidence of immunity was obtained when vaccinia virus, killed either with formalin, heat or phenol, were injected into rabbbits. In guinea-pigs, however, it has been found possible to produce complete immunity to a small test dose of virus, and partial immunity to larger doses. This result is obtained whether the virus is killed by formalin, heat or phenol, and no one route of inoculation appears better than another. The degree of immunity obtained is much inferior to that produced with living virus. Work is now being started with monkeys. The cost of the animals used in this investigation is defrayed by the Ministry of Health.

An investigation is being conducted in collaboration with Dr. **CLARK-KENNEDY**, Dr. **KERRIDGE**, and Dr. **RYKERT**, on the variation in complement content of human serum during shock.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

The Future of the Medical Profession.

THE editor of the *Deutsche Ärzteblatt*, the organ of the Ärzte-Vereinesbund, draws attention to the continued increase in the number of medical students. In the summer of 1929, 15,067 medical students were on the register, as against 9660 in 1927. Of these 15,067, 1457 were in the last year of their curriculum, but 3527 in the first year. The editor says that the profession will soon be drowned in this tide of intending medical men if the flow towards medical study goes on. It is true that university training in general has much increased, but in no other profession has it increased to such a degree as in the medical. The shortage of hospital assistants, to which I have already referred[1] has induced many young men to study medicine. But this shortage is only temporary, and it is too often forgotten that qualified medical men after their assistantship have to wait several years until they are admitted to practise with clubs, under the Insurance Act, and that almost the whole profession depend on such practice for their livelihood. The exclusion of nearly 3000 medical men desiring to practise with the sick clubs is founded on a Government regulation under the Emergency Act of 1923. A provision of this Act gives the Government for a certain time the power to take such measures without passing a special law. As things stand, a medical man must wait three years before being admitted to club practice at his residence and five years if he has come to a new locality. The editor proposes that the number of medical students should be reduced by a new provision that medical men must wait 10 years for their admission to club practice. This provision would not affect those who are already students.

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[1] Proc. Soc. Exp. Biol. and Med., 1929, xxvii., 129.

[1] THE LANCET, 1928, ii., 820.

Serotherapy of Scarlet Fever.

Dr. Gabriel reports in the *Jahrbuch für Kinderheilkunde* that 428 scarlet fever patients were divided in two groups for the purpose of ascertaining the value of scarlet fever serum. One group was treated symptomatically, while the other received scarlet fever serum produced by the Behring works. Where no effect was apparent a second injection was performed after 24 hours. The results recorded were almost negative. The percentage incidence of complications in the injected series was 60·5, and in the controls 71; but if the complications due to the injections themselves are added (8·5 per cent.), the percentage complications in the injected series amounts to 69. Serotherapy was thus not very efficacious. Apparently the fever in the acute stage of the illness was reduced, but critical decrease of temperature was observed in a few cases only. Gabriel states that a definitive opinion cannot yet be given owing to the very benign character of the present epidemic.

Broadcasting and Medical Practice.

A somewhat curious judgment was lately given by a law-court in Karlsruhe. An engineer, being disturbed during listening-in by rattling in his wireless set, ascertained that this was due to high-frequency currents coming from diathermy and X ray apparatus of a neighbour who was a medical man. He therefore asked for an injunction, an action requiring that the latter should be prohibited from using this apparatus. Although it did not entirely agree with the plaintiff's demand, the court ordered the medical man not to use his apparatus between 12.30 and 2.30 P.M. or between 8 and 12 P.M., under penalty of an imprisonment not exceeding 6 months and a fine. This judgment has caused some astonishment in the profession. A medical journal asks whether the doctor should be prohibited, for instance, from using X rays at these hours to ascertain the presence of a foreign body—in order that the plaintiff may be able to hear operatic melodies or dance to the tunes of the broadcasting orchestra. The defendant has, of course, appealed to a higher court, requiring annulment of the judgment.

An American Hospital in Berlin.

Prof. Bucky, a radiologist formerly well-known in Berlin, has returned home after eight years' work in New York. He has been appointed radiologist at the Virchow Hospital in succession to the late Prof. Levy-Dorn, who was one of the earliest radiologists and died some time ago from X ray cancer. With the aid of the mayor of New York, of American financiers, and of the Rockefeller Fund, Dr. Bucky plans to establish an American hospital in Berlin, with an American staff and American nurses. The hospital is to be connected with a German-American medical society and will be a centre for American medical students and American medical men who come to Berlin for post-graduate study. Moreover, it is planned that young medical men on the staffs of Berlin and New York hospitals should be exchanged, so that they may become acquainted with the methods of treatment in the other countries.

Gonococcal Arthritis.

Dr. Müller reports in the *Archiv für Dermatologie* that of 10,570 patients with gonorrhœa 296 (2·8 per cent.) had arthritic complications, the percentage being in men 3·5 and in women 2·1. A connexion with trade or profession, season or time of incubation could not be ascertained, nor was trauma or over-exertion proved as a cause. In two-thirds of the cases the disease was monarticular. A certain predisposition to arthritis is shown, says Dr. Müller, by the fact that some patients are affected with arthritis whenever they catch gonorrhœa.

Premarital Advice.

The association of official matrimonial advisory boards has issued a warning against private institutions recently founded by philanthropic and benevolent societies. It explains that these institutions as a rule have not the necessary experience and that their work is thus apt to discredit activities of this kind and so hinder the development of the movement.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

X Ray Diagnosis of Early Phthisis.

AT the end of last year our premier public health journal called attention to the importance of the X ray film in making an early diagnosis of tuberculosis, and inquired if some progressive health department would not provide gratuitous X ray service for the benefit of people in the community unable to pay for it. This has brought out the information that the New York City Department of Health has already had such a service in operation for the past six months. The demand for this service has proved so great that a new station has recently been opened in Brooklyn, and two more are to be established shortly in New York. Patients are received only by reference from a physician to whom a written report is furnished. No treatment is offered to the patient, though the stations are prepared to help physicians to obtain suitable institutions whenever institutional treatment is indicated.

Mortality of Wage-earners in 1929.

With its usual promptitude the Metropolitan Life Insurance Company has brought out an analysis of the causes of death among the 19 million industrial policy-holders. In spite of the influenza epidemic new records for low mortality have been made in several respects. The tuberculosis death-rate of 85·6 per 100,000 is the lowest yet recorded, and leads to a prophecy that a rate in the region of 40 per 100,000 may be expected by 1940. The previous low point was 90·6 recorded in 1928. Low records have also been made for the communicable diseases of childhood, and for diarrhœa and enteritis. The present rate for the latter cause is 7·8, little more than one-quarter of the figure registered 18 years ago. The maternal mortality also showed encouraging improvement, declining to 13·5 per 100,000 from a previous low record of 14·2 in 1928. Organic heart disease and cancer continue to show rising mortality. The cancer problem is growing increasingly serious. In spite of its comparative accessibility and all the educational campaigns, cancer of the breast is responsible for a rising death-rate between the age of 45 and 64 years. There is no evidence of a significant decline in the cancer death-rate for any organ or part of the body. The 1929 death-rate for automobile accidents was 20·9 per 100,000, a rise of 12 per cent. over the previous year, and an increase of 809 per cent. over the rate for 1911. One-half of the automobile fatalities are pedestrian cases. From 35 to 40 per cent. are children under 15 years of age. The automobile is as dangerous to child life as measles, scarlet fever, and whooping-cough combined.

A slight increase is recorded in the rate for acute and chronic alcoholism. The present rate (3·4) is nearly six times as high as that for 1920, the first year of national prohibition. It is not quite so high as for pre-prohibition years, though if the deaths from wood alcohol and denatured alcohol be added and deaths in the United States are considered, the rate would equal or closely approximate those for certain pre-war years. The mortality from alcoholism among the 600,000 policy-holders in the Province of Quebec is much less than in the United States. If the rates for the latter had prevailed in Canada there would have been 288 deaths there in the last eight years instead of the 48 actually recorded.

Control of Narcotic Prescriptions.

Unusual powers are to be taken by the U.S. Commissioner of Prohibition if Bills now before Congress and actively supported by the Hearst Press should become law. The Commissioner will have free discretion to make regulations governing the issuing, suspension, and revocation of licences to prescribe narcotics. No one who has been convicted of any offence, however trivial, against a Federal or State law relating to narcotics may again be licensed under the provisions of this Bill. Nor may a narcotic addict be licensed, and it is left to the Commissioner to decide when a person qualifies for addiction. The Commissioner will decide what records must be kept, what drugs may or may not be used, what reports may be required from the licentiate, and so on. It is hardly surprising that the medical profession in this country does not welcome bureaucratic control of medicine by the State.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

Competitive Examination for the I.M.S.

IN the Leglislative Assembly on Jan. 28th a resolution was passed, in spite of official opposition, recommending that the Government should revive the competitive entrance examination for officers of the Indian Medical Service, the examination for this purpose to be held concurrently in England and India. The Government contended that the time for the revival of this examination had not yet been reached. The examination referred to has been in abeyance since 1915, candidates at present being selected after interview by a committee appointed for the purpose, and, at first sight, it might appear desirable that the method of selection by examination should be revived. This, at any rate, seems to be the opinion of Colonel Gidney, who, in supporting the motion as spokesman of the European group, said that I.M.S. officers recruited during the last few years were not up to the standard of those recruited before the war. But surely it is obvious that the alleged inferiority of present-day entrants is due, not to lack of a competitive examination, but to lack of competition to enter a service which has lost so much of its former attraction for recently qualified men. The mere revival of a competitive examination where there is little or no competition for entry is unlikely to improve the quality of the entrants. In former years one of the chief attractions of the I.M.S. was the chance of employment on the civil side, with the wide fields for clinical and research work which such employment offered. Now, after a number of years, during which extremely few Europeans could be spared for transfer to civilian duties from the military side, a diminution of military requirements, and the increasing numbers of British entrants recently recruited, will enable the way to civil employment to be opened up once more. It is to this fact, rather than to the revival of a competitive examination, that any future increase in the numbers and quality of I.M.S. entrants will be due.

Whatever political agitators may say, and in spite of the growth of medical education in India, that country will need British doctors for a long time to come. Even Mr. Gandhi (who was himself operated on by a British surgeon in the I.M.S.) would probably admit the truth of this statement. In any case, until there is a very considerable increase in the number of candidates a revival of the competitive entrance examination is unlikely to affect the standard of the entrants for the I.M.S.

Illicit Drugs.

Signs are not wanting that the smuggling of morphine and its derivatives, as well as of cocaine, is carried on to a large extent in India, and the customs authorities in the larger ports frequently find consignments of these drugs concealed in merchandise, or hidden away in the crew spaces, particularly of foreign steamers. For one case of this description which is discovered there must be many which pass undetected, and the profits resulting from traffic of this sort are so large that it is difficult to put a stop to it. There is reason to believe that considerable organisations are at the back of the trade, and a recent number of the *Pioneer* gives details of a case detected by the Cairo Narcotics Bureau which throws an interesting light on the methods employed. Suspicions having been aroused, a consignment of a thousand tins of powder glue from Basle was detained at the Cairo customs house. Every tin was opened, and four of them were found to contain a white powder which, on analysis, proved to be a derivative of heroin. The matter was followed up, and the Basle police unearthed an extensive organisation for the manufacture and distribution of illicit drugs possessing branches at Geneva, Lausanne, Zurich, Mulhouse, and certain German towns. Increased taxation of alcoholic liquors, and the stiffening-up of measures to check illicit distillation, are no doubt encouraging the consumption of narcotic drugs in general, and it is of the utmost importance that this underground traffic should be made as difficult as possible. If others of the wealthy interests involved can be run to earth a great advance will have been made.

Crimes of Violence.

The psychology of crime in eastern countries generally is perplexing. Has anyone explained, for instance, how it is that the peoples who profess that mildest of all religions, Buddhism—Chinese, Thibetans, Burmese—have evolved the most revolting tortures; or how it comes to pass that certain Indian communities, of orthodox Hindu principles and strictly vegetarian, are notorious for crimes of violence? Indian police records are full of cases which show how inflammable is the material with which the forces of law and order have to deal, and the following are a few which have recently been reported in the press, within a few days of each other. In one, a young woman who had acquired an intense dislike for her step-daughter, aged 8 years, took the child and placed it in an oven—subsequently removing it in order to torture it further with a sharp instrument. Here the motive was apparently revenge, owing to a beating she had suffered at the hands of her husband to whom the child had complained. In a second case, in which a light engine had collided with a motor-bus at a level crossing, killing four passengers and gravely injuring four others, the mob which collected, apparently incensed without reason, attacked the driver of the engine with stones and sticks, and attempted to force him into the furnace of his own locomotive. The man, in fact, was only saved by the plucky action of a railway policeman, who fought his way to him, and protected him until further assistance arrived. The origin of a third recent example was a feud which developed between two men and their elder brother on account of some money matters. The two younger brothers were on their way with 13 other men to another village when they were ambushed by the elder and some confederates, who attacked them and left no less than eight dead on the ground. The ferocity which produced the tragedy of Chauri Chaura, when every man of an isolated police post was murdered under circumstances of the utmost barbarity, is still not far to seek, and it is difficult to predict what developments the criminal mentality of the underworld may not evolve in India, where an old man has been known to offer himself to be butchered on his enemy's doorstep by his own relations, in order to enable a charge of murder to be fabricated against him; and where the penal code provides for the offence of cutting oneself, and shedding one's blood in a stranger's house in order to defile it, in retaliation for a refusal to give alms.

Shortage of Women.

It is remarkable that not only in towns and cities where an influx of males for industrial purposes may account for it, but also under other conditions, the female population of the Punjab, so far from exceeding the male, as in Great Britain, is actually considerably less numerous. The public health report for 1928, in drawing attention to the deficiency, comments on the fact that the rise in total population, which is occurring, is increasing rather than diminishing the relative shortage of women in the province. One factor in producing this disproportion is the excessive female death-rate; another is that the male birth-rate habitually exceeds the female. The director of public health is of the opinion that the most hopeful method of attacking this problem is by concentrating on measures to promote the welfare and improve the health of women, and he takes the opportunity of emphasising the desirability of renewed efforts in the field of maternity and child welfare work. It is noteworthy that in the year under report a considerable proportion of the excess in female mortality occurs between the ages of 1 and 5.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 22ND, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 376 (last week 322); scarlet fever, 2551; diphtheria, 1747; enteric fever, 31; pneumonia, 1624; puerperal fever, 46; puerperal pyrexia, 119; cerebro-spinal fever, 8; acute poliomyelitis, 4; acute polio-encephalitis, 1; encephalitis lethargica, 19; dysentery, 7; ophthalmia neonatorum, 102. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Feb. 25th–26th was as follows:—Small-pox, 621 under treatment, 18 under observation (last week, 563 and 30 respectively); scarlet fever, 2210; diphtheria, 2768; enteric fever, 16; measles, 1066; whooping-cough, 88; puerperal fever, 36 (plus 22 babies); encephalitis lethargica, 121; "other diseases," 17. At St. Margaret's Hospital there were 11 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 123 (48) from measles, 11 (2) from scarlet fever, 31 (2) from whooping-cough, 59 (15) from diphtheria, 46 (15) from diarrhœa and enteritis under two years, and 84 (12) from influenza. The figures in parentheses are those for London itself.

The fatal case of enteric fever outside London occurred in Preston. Fatal cases of measles were concentrated at Portsmouth and Manchester each 13, West Ham 9, Sheffield 6, Oldham 5. Bradford and Cardiff each reported 4 deaths from whooping-cough, Birmingham and Nottingham each 3. Diphtheria claimed 6 victims at Liverpool, 5 at Birmingham, and 3 each at Derby, Hull, and Merthyr Tydfil. There were 5 deaths from diarrhœa at Birmingham, not more than two in any other town. Deaths attributed to influenza were widely scattered, the highest figures being Manchester 6, Liverpool 5, Sheffield 4, and Cardiff 3.

The number of stillbirths notified during the week was 295 (corresponding to a rate of 44 per 1000 births), including 60 in London.

RATE AID FOR A HOSPITAL.—Tottenham District Council has decided to give the proceeds of a halfpenny-rate to the Prince of Wales's Hospital.

Correspondence.

"Audi alteram partem."

PSITTACOSIS.

To the Editor of THE LANCET.

SIR,—The recent observations of S. P. Bedson, G. T. Western, and S. Levy Simpson on the ætiology of psittacosis have rendered it doubtful if *B. psittacosis* (*B. aertrycke* (Mutton)) has anything to do with the present epidemic. In their series of cases it was impossible to find any bacteriological or serological evidence of this organism; on the other hand, their results suggest that the disease is due to a filtrable virus. In the paper on psittacosis by Dr. A. P. Thomson and Dr. W. T. Hillier in THE LANCET of Feb. 22nd mention is made of the agglutination reactions of some of the infected patients with organisms of the typhoid-paratyphoid group. In view of the negative findings in the cases reported by Bedson and others, it becomes a matter of considerable importance to estimate the true significance of these agglutination results. In this connexion I would recall some work by Dr. H. A. Fielden and myself, published in THE LANCET (1922, i., 1088). Large numbers of sera from members of the population who were not suffering from disease of an enteric nature were tested against *B. typhosus*, *B. paratyphosus* A, B, and C, *B. aertrycke* (Mutton), and *B. enteritidis* (Gaertner). The result of testing 1000 sera against these organisms was as follows:—

29	per cent. agglutinated	*B. typhosus*.
17	,, ,,	*B. paratyphosus* A.
23	,, ,,	*B. paratyphosus* B.
8	,, ,,	*B. paratyphosus* C.
16	,, ,,	*B. aertrycke* (Mutton).
11	,, ,,	*B. enteritidis* (Gaertner).

The macroscopic technique was employed and the agglutination occurred at titres of 1/20 or higher. The tests were performed a few years after the war, and therefore a considerable proportion of this agglutination was, no doubt, the result of preventive inoculation with TAB. vaccine. This became clear when the sexes were taken separately. Since many more men than women had received preventive inoculation, the percentage of males agglutinating was found to be much higher, thus:—

Percentage of 276 sera from males.	Percentage of 165 sera from females.	Organism agglutinated.
42	5	*B. typhosus*.
28	2	*B. paratyphosus* A.
39	7	*B.* ,, B.
11	3	*B.* ,, C.
23	15	*B. aertrycke* (Mutton).
11	5	*B. enteritidis* (Gaertner).

This point was further emphasised by testing sera from people who were known not to have been inoculated.

Percentage of 111 males known to be uninoculated.	Percentage of 61 females known to be uninoculated.	Organism agglutinated.
4·5	1·5	*B. typhosus*.
Nil.	Nil.	*B. paratyphosus* A.
4·5	4·9	*B.* ,, B.
4·3	5·6	*B.* ,, C.
9·9	10·9	*B. aertrycke* (Mutton).
3·6	7·8	*B. enteritidis* (Gaertner).

B. psittacosis is now regarded as being identical with *B. aertrycke* (Mutton), and therefore from the above evidence it is justifiable to expect about 10 per cent. of the uninoculated and approximately double this percentage of the inoculated population to agglutinate this organism. As regards the agglutinin titres which were encountered for *B. aertrycke* (Mutton), the majority were on the 1/20, 1/40, and 1/80 mark, but a titre of 1/320 was obtained in an uninoculated person who had never had enteric or gastro-enteritis, and a titre of 1/640 occurred in an inoculated case. As a result of the work, we came to the conclusion that if a diagnosis was to be made on a single test, not less than a titre of over 1/1000 should be considered suggestive of infection with this organism; a titre of over 1/2000 is very strongly suggestive of infection. As these conditions have not been fulfilled in the cases of psittacosis referred to, it seems very doubtful if the agglutination results recorded have much significance.

In the current issue of the *British Medical Journal* Dr. J. C. Hamilton describes a case of infection with *B. enteritidis* resembling psittacosis. The diagnosis in this case was made because on the 10th day of the illness the patient's serum agglutinated *B. enteritidis* at a dilution of 1/50, and on the 20th day the same bacillus was agglutinated at a dilution of 1/25. If our tables are studied it will be seen that anything from 3 to 11 per cent. of the population can be expected to agglutinate *B. enteritidis* at titres of 1/20 or higher. In the course of our examinations, two titres of 1/320 were recorded in apparently healthy people, so that a titre of 1/50 can by no means be considered diagnostic. Furthermore, the fact that the agglutinins on the 20th day of disease had not risen above 1/50 is, to my mind, evidence against the patient suffering from an infection with this organism, for in these enteric infections the agglutinins usually increase rapidly and reach a maximum between the 18th and 21st days of disease. To give an example of this Dr. G. Selby Wilson and myself recorded a case of enteric infection due to *B. enteritidis* (THE LANCET, 1921, i., 16), and in this case the titre for *B. enteritidis* was 1/160 on the 12th day of disease, 1/320 on the 16th day, 1/3200 on the 22nd day; it then started to fall, so that by the 27th day it was 1/2000 and three weeks later it only reached 1/160.

For these reasons I do not consider that the serological results in Dr. J. C. Hamilton's case warrant a diagnosis of infection with *B. enteritidis*.

I am, Sir, yours faithfully,

ARTHUR B. ROSHER.

Charing Cross Hospital Institute of Pathology, W.C.,
March 3rd, 1930.

To the Editor of THE LANCET.

SIR,—Psittacosis is at present in the minds alike of doctors and the lay public, and at the risk of producing a redundance of clinical evidence I would ask space to report briefly a case at present under my care which presents some unusual features.

On Jan. 16th, 1930, Mrs. B. was given a blue front Amazon parrot. Very soon it exhibited signs of ill-health and died on Jan. 28th, 1930. The autopsy revealed "parrot disease." On Jan. 29th, 1930, Mrs. B. complained of sore-throat and headache, and sent for Dr. Arnold Morris. After two or three days in bed her condition showed improvement, but by the end of the first week of her illness she settled down into a typhoid state; twitchings and delirium occurred together with sleeplessness and severe occipital headache. In this condition she was admitted to the Warneford Hospital on Feb. 5th, 1930. She was profoundly ill. T. 105° F., P. 140, R. 30. At this stage the only positive physical signs were a little impairment and a few crepitations in the left axilla; there were no signs of pneumonia. Respirations were calm, pulse-rate rather frequent. The spleen was just palpable. The patient remained in a drowsy state and on the tenth day of the disease signs of consolidation occurred at the bases of both lungs. At the same time a crop of rose spots appeared over the lower part of the chest and on the next day there were several more on the back. On the twelfth day the temperature began to fall and had reached normal by the fifteenth day, the pulse-rate gradually subsiding but still remaining rather more frequent than is usual in this infection.

The Widal reaction on the tenth day showed a partial reaction 1–15 to *B. typhosus*, otherwise no reaction with the enteric group nor with *B. psittacosis* (two strains). On the seventeenth day all these reactions were completely negative. The blood picture showed a leucocyte count of 7200 per c.mm., of which 83 per cent. were polymorphonuclear and 17 per cent. were lymphocytes. Culture of fæces and urine showed no evidence of pathogenic bacilli of the enteric group. The recovery of the patient is now apparently complete.

The chief points of interest of this case seem to be: (1) The certainty of the diagnosis from the circumstances of the case and the clinical features. (2) The complete absence of any cough or sputum. (3) The occurrence of rose spots. (4) Negative serological and bacterial findings.

Whether the "filtrable virus" described by Bedson, Western, and Levy Simpson is capable of producing in man a condition so similar to that caused by the typhoid group of organisms must at present remain sub judice.

I am, Sir, yours faithfully,

Leamington, Feb. 28th, 1930. FRANK CLAYTON.

THE MECHANISM OF PULMONARY COLLAPSE.

To the Editor of THE LANCET.

SIR,—In massive collapse of the lungs Sir John Rose Bradford selected a very appropriate subject for his lecture to the Royal College of Surgeons. Few subjects that are of equal interest to both physicians and surgeons are more frequently overlooked, and none has given rise to greater diversity of opinion among those who are familiar with it.

Sir John Rose Bradford's work is well known to all those who take an interest in massive collapse, and the profound theory, which he has formulated as a result of his study of the phenomenon in its most baffling form, following injuries of the chest wall, has influenced many in their opinion of the probable mechanism of its causation. As one, however, who has not had, and probably never will have, an opportunity of studying massive collapse in these very unusual circumstances, I may perhaps be excused for pleading that there is another way of approaching the problem, that is by endeavouring to explain these apparently inexplicable cases in the light of what emerges as tolerably certain from a study of massive collapse in its less complicated forms.

It can be safely said that there is only one method of producing massive collapse experimentally, and that is by complete obstruction of the bronchial tree. So long ago as 1845 it was known that obstruction of a bronchus was invariably followed by collapse of the area of lung which it supplied, providing that its blood-supply was intact; and since then this finding has withstood the brunt of repeated investigations.

It is equally certain that the sum of the experimental attempts to produce massive collapse in any other way—such as by completely or partially paralysing the respiratory musculature, or by the application of all varieties of stimuli in the hope of awakening a hidden reflex—is complete failure. If we add to these considerations the evidence of the physical signs of massive collapse (which, I hope Sir John Rose Bradford will agree, can be admirably explained in their earliest phase by the presence of a bronchial block, and later, by the persistence of secondary changes of all grades of severity in the lung, when the obstruction has been removed), it appears likely that the elucidation of the mystery of massive collapse will be best served in the future if we ask ourselves, how can bronchial obstruction have come about in this case, and why?

It is possible, for instance, that Pasteur's post-diphtheritic cases were due to the direct spread or aspiration of the membrane rather than to diaphragmatic paralysis, which was not present in all the cases, and it is probable that those cases occurring in association with high transverse lesions of the spinal cord, anterior poliomyelitis, debility, &c., owe their bronchial obstruction to the same factors which appear to predispose to the post-operative cases—namely, bronchitis, postural deflation of the lungs, inhibition of the cough reflex or suppression of the expulsive efforts; and gravity. Even the most difficult cases of all—namely, Sir John Rose Bradford's contralateral cases following slight injuries—may admit of the same explanation; because the lungs in the thorax have been found to respond to non-penetrating trauma in much the same way as the brain in the cranium, and to sustain the greatest damage sometimes by a contre-coup mechanism on the opposite side to the injury. Given this contralateral damage, with voluntary suppression of the cough reflex for the short period which is necessary for it to pass into abeyance, and one has the material for an explanation of the occurrence of contralateral massive collapse, which is compatible at once with the physical signs and with the experimental evidence, which, if it is to be regarded as untrustworthy, is certainly unanimous.

I would like, Sir, to add a few observations on Dr. Fuller's interesting investigation into post-operative pulmonary complications at University College Hospital (THE LANCET, Jan. 18th, p. 121). Although it is a little difficult to arrive at figures which are strictly comparable, it does not seem that the incidence of complications encountered by him is any larger than that observed by Dr. Sheret and myself (THE LANCET, 1928, ii., 111), which at the time seemed appallingly large. Indeed, considering that the series in both papers is comparatively small (Dr. Fuller's is much larger than our own), one is surprised at the very striking similarity between the findings. Cases presenting Pasteur's classical picture of massive collapse, and cases of undoubted embolic origin, were few in both series, and of about equal frequency. We have also encountered, then and since, a complication distinguished from the others by the persistent gravity of the patient's condition and physical signs, suggesting lobar pneumonia from the onset. There, however, the resemblance to lobar pneumonia ended. The patients all succumbed between the fifth and ninth day after operation, with no other cause for death than the lung condition, and at autopsy a diffuse pneumonitis was found with more or less confluent gangrene. These cases probably constitute a distinct group, but it is questionable whether true lobar pneumonia occurs among the complications of operations.

The difference between our conclusions concerns the remaining, and, incidentally, the great bulk of all the cases, which Dr. Fuller regards as primary broncho-pneumonias, and in which we prefer suspect cases of massive collapse and its sequelæ. The question is, of course, quite an open one. Bronchitis, which is undoubtedly the most frequent of all post-operative chest complications, will predispose to either, and in many instances the lung changes are patchy and do not involve a whole lobe. But our main point remains, that if all cases of massive collapse are to be recognised, cardiac displacement, which can be demonstrated clinically, must not be regarded as a sine qua non for the diagnosis for the following reasons:—

1. Because, in a great many instances, it is impossible to form even an approximate idea of the position of the heart.

2. Because bilateral collapse of the lower lobes undoubtedly occurs, the heart necessarily remaining normal in position, while in those cases following severe upper abdominal operations, in which a marked degree of postural deflation has occurred, one lower lobe can, in our opinion, completely collapse without leading to any cardiac or mediastinal displacement, the upper lobe being able to fill the diminished pleural space; and in cases in which the left lower lobe alone is involved, we think that the heart follows the receding lung, not so much by a lateral movement, as occurs on the right side, as by rotating backwards—a displacement which cannot be appreciated clinically.

3. Because, in a great many of these cases, early X ray examination will reveal displacement of the heart or mediastinum, or both, the existence of which is not suspected, as well as showing a marked diminution in the size of the shadow cast by the affected lower lobe.

Further, we think that the symptomatology, physical signs, and clinical course of the cases in this group are so similar to those of the cases in which cardiac displacement is demonstrable clinically, that it is impossible to escape the inference that in their essentials there is no difference between them.

Our experience of the effects of postural drainage of the bronchial tree leads me to disagree with Dr. Fuller's opinion that the first day temperature is not to be attributed to the chest changes, because patients so drained rarely have any temperature at all; and while it is quite true to say that the "collapse," produced by artificial pneumothorax, is not followed by inflammatory complications, the lung in these cases is not completely airless, and the evidence, both experimental and clinical, is very definite that the airless lung behind an occluded bronchus cannot remain undamaged for more than 72 hours, and rarely as long as that.

Although post-operative postural drainage of the bronchi is not comfortable for the patient, is unorthodox, limited in its applicability, and even, I suppose, not entirely free from the objection that it may expose the patient to greater dangers that it is designed to prevent, it certainly produces a greater reduction in the incidence of chest complications than has been claimed for any other method.

I am, Sir, yours faithfully,

London, Feb. 24th, 1930. CHARLES R. BOLAND.

THE APPLICATION OF GAMMA RADIATION TO DEEP-SEATED TUMOURS.

To the Editor of THE LANCET.

SIR,—In the application of gamma radiation to deep-seated tumours two or more convergent beams so adjusted as to intersect within the tumour have been used. I suggest, in what follows, a mode of application which appears to possess certain advantages and which, so far as I know, has not hitherto been tried.

One beam only is required, but this beam is caused to describe continually a conical path, the apex of the cone being within the tumour. Thus the radiations reaching the tumour are virtually focused in the tumour, in the sense that this becomes the region of maximum radiation. As the beam sweeps out its conical path its track where it traverses the surface of the body approximates to a circle of entry. The beam traverses this circle in one revolution. It follows that the risk of surface burns must be much less than if a fixed beam, or two or more such fixed beams are employed. This reasoning applies also to risk of lesions within the body of the patient. In fact the concentration is obviously a maximum within the tumour and falls off rapidly in the surrounding tissues. The fact of continually changing inclination of the rays within the tumour might be expected to be in itself advantageous. Of course, the use of two or more such beams suitably spaced around the cone of revolution would be admissible.

A very simple mechanical arrangement will suffice to realise this mode of application of gamma radiation. The drive may be purely mechanical or electrical, and the whole apparatus carried on a suitable stand, combining steadiness with easy adjustment of the cone of radiation.

It will be evident that the convergent rotating beam may be caused to describe any path called for by the extent and form of the tumour. A central rotating cam of the required form and dimensions would suffice for this purpose.

I am, Sir, yours faithfully,
J. JOLY.

Radium Institute, Royal Dublin Society, March 4th, 1930.

FOOD OR DRUG?

To the Editor of THE LANCET.

SIR,—In your annotation (March 1st, p. 475) you say I omit "to point out that the four doctors in question have had all the consideration which the Insurance Acts allow." In my letter to the *Saturday Review* to which you refer I did no more than call attention to a report in the *British Medical Journal* and draw certain fairly obvious deductions. I cannot believe that you can have any real sympathy with a procedure which, while holding up for our admiration the general professional conduct of the four men concerned, condemns them to an extremely heavy fine. Do not lose sight of the fact that, according to the report, they had the sympathy and support of the Ministry of Health; that it was the London Panel Committee, not the Ministry, which condemned them.

There is now a fresh, most perplexing, point. In the current *New Statesman* is an account of what is said actually to have happened. If that be a correct account the whole affair appears queer indeed; for it is there stated that when "examined first by a professional committee of their colleagues" that committee expressed the opinion "that the prescribing was not in excess of what was reasonably necessary for the adequate treatment of the insured patients."

I submit that the profession as a whole should see the entire facts published in the responsible medical journals. The matter by now has gone far beyond any hair splitting as to whether "malt with oil" is a food or a drug. That, together with the exact definition of liver extract, insulin, pituitrin, &c.—all used to make up deficiencies—is a nice debating point. The question at issue is one concerning the administration of justice within the profession. As such, *all* the facts should be published.

I am, Sir, yours faithfully,
Walsall, March 2nd, 1930. FRANK G. LAYTON.

To the Editor of THE LANCET.

SIR,—In your issue of March 1st you refer editorially to the penalising of four practitioners to the tune of £100 for the offence of prescribing for their panel patients drugs and appliances more frequently than is customary in their area; and you raise an objection to Dr. Layton's criticism of the Insurance Committee's action, on the ground that he omitted "to point out that the doctors in question had all the consideration which the Insurance Acts allow." It is interesting to recall that an almost identical comment was made on the trial and sentence of Jeanne d'Arc. However, it is not to protest against complacency that I am writing, but to ask you to correct, or to allow me to correct, two or three misstatements of fact. You say that "their case was examined by a professional committee of their colleagues and then by the Insurance Committee, with a final appeal to three independent referees. This board of referees was composed of two medical practitioners and one lawyer, in actual practice. Each time the doctors had the opportunity of stating their position." I write as one of the four practitioners to whom you refer, and my knowledge is at least first-hand. As reported in the *British Medical Journal*, the charge against us of excessive prescribing was heard by a special Subcommittee of the London Panel Committee deputed for that purpose. Twelve members were present. An entire afternoon was devoted to this case, and to this case alone. The "charge against us" was presented at great length by a representative of the Ministry of Health. After hearing explanations by the senior partner of the firm, this Committee reported that it "was of opinion that the prescribing was not in excess of what was reasonably necessary for the adequate treatment of the insured patients." The Panel Committee (which had not heard the evidence) declined to accept this verdict, and referred the matter to a Committee with a different personnel, six members of which never heard the evidence on either side. This semi-absentee Committee reversed the verdict of the body which had heard the evidence, and its report was accepted by the Panel Committee, before which the practitioners concerned were at no time given an opportunity of appearing. They requested to be allowed to make representations to the Insurance Committee, but were given no chance of doing so. The tribunal of "three independent referees" to which you refer had not the composition you state. They were appointed and paid by the Ministry of Health, one of the parties to the dispute. "A lawyer in actual practice" was not one of them.

Your statement that the doctors "prescribed cod-liver oil for its nutritive value" is not correct. The practitioners were definite on this point, and their statement was undisputed. Throughout, the whole discussion on this matter was as to the anti-infective value of vitamin A and the justifiability of prescribing preparations containing it.

So much for misstatements. Your leader-writer omits to mention a number of relevant facts. He makes no reference, for example, to the fact that, although these practitioners issued a greater number of prescriptions than the average for London, their attendances on their patients were also approximately double the average. He gives no hint of the tribunal's finding that the practitioners concerned had "organised a highly efficient treatment centre in a poverty-stricken quarter, where the chances of health are poor indeed." Nor does he refer to the recommendation that, if any penalty were thought necessary, it should not be a "punitive" one. You will, I am sure, agree that any criticism has more value if the facts are all on the table.

I am, Sir, yours faithfully,
March 2nd, 1930. ONE OF THE FOUR OFFENDERS.

CENTRAL CLINICS FOR RHEUMATISM.

To the Editor of THE LANCET.

SIR,—In the leading article on Central Clinics for Rheumatism in your issue of March 1st, 1930, in speaking of the new clinic for the treatment of rheumatism, to be erected by the Bermondsey Borough Council, you make the following statement:—

> "In the first place, the London County Council declined to advance a loan on the ground that, under the new Local Government Act, the County Council itself was the proper authority to provide treatment of this kind."

I feel it necessary to point out to you that this statement is misleading and contrary to the facts. The original proposal put forward to the Council by the Bermondsey Borough Council was for the erection of a clinic:—

(1) for the diagnosis and treatment of cancer, rheumatoid arthritis, rheumatism, &c.; and

(2) to replace the existing tuberculosis dispensary and the maternity and child welfare clinic in Grange-road.

The Council declined to sanction the loan asked for by the Borough Council for these purposes on the grounds: (1) That cancer was a disease which could not be adequately dealt with by means of an ad hoc clinic, but required facilities for its diagnosis and treatment which could only be provided in a properly equipped hospital. (2) That the existing tuberculosis dispensary in Grange-road was suitable and adequate for its purpose. (3) Furthermore, it was pointed out that cancer, &c., might cover the whole range of medicine and surgery. The Borough Council appealed to the Minister of Health, who directed that a public inquiry should be held by one of the medical inspectors of the Ministry. Following upon the report of the inspector, the Minister directed the Borough Council to make a new application to the Council limited to rheumatism and the provision of more suitable premises for the tuberculosis and maternity and child welfare work of the Borough Council.

I am, Sir, yours faithfully,
F. N. K. MENZIES.

L.C.C. Public Health Department, County Hall, S.E.,
March 4th, 1930.

To the Editor of THE LANCET.

SIR,—In commenting on the Peto Place Clinic for Rheumatism in THE LANCET of last week (p. 480) you say that "the costs of construction and equipment have been covered by the interest on the appeal fund and the capital remains intact." The whole of the sum raised for the construction and equipment of the Clinic has been expended. The interest earned on donations as they were received by the British Red Cross Society from the public more than met the cost of making the appeal.—I am, Sir, yours faithfully,

F. C. DAVIES,
Secretary, Central Clinic for Rheumatism.
19, Berkeley-street, W., Feb. 28th, 1930.

WE have received from Mr. Haydn Brown in reference to a review last week of Dr. Edmund Jacobson's book, "A Physiological and Clinical Investigation of Muscular States and their Significance in Psychology and Medical Practice," a letter in which the writer finds clear indications that Dr. Jacobson has reached essentially the same conclusions and practical results as were published by him in 1918 in "Advanced Suggestion." He concluded by hoping that his name may soon be restored to the Register "upon my again expressing regret that I should ever have felt compelled into occasions which have offended them."

Obituary.

MAURICE R. J. HAYES, F.R.C.S. IREL.

DR. HAYES.

Photograph by Lafayette.

Prof. Maurice Hayes, who died on March 2nd, was born in County Limerick 51 years ago, and was educated first at Limerick, and later at the Catholic University School of Medicine, Dublin. Qualifying in 1906 he became a Fellow of the Royal College of Surgeons in Ireland in 1908. For a short time he was engaged in general practice in Dublin, but having been appointed to the charge of the X Ray Department of the Mater Misericordiæ Hospital, he determined to specialise in radiology. This decision was fully justified by results, for in a brief time he was in the enjoyment of a large practice in that field, and was regarded as the leading radiologist in Ireland. During the war he was attached to the staff of the Dublin Castle Red Cross Hospital, and in 1917 he served in the British Expeditionary Force in the "83 (Dublin) General Hospital." In 1921 he was appointed to succeed the late Dr. Martin Dempsey as professor of materia medica and therapeutics in University College, Dublin, National University of Ireland. Shortly after this, pressure of work necessitated his retirement from the staff of the Mater Misericordiæ Hospital, for his private practice was largely increasing. In the summer of 1922 a new and urgent duty was cast upon him. When hostilities broke out in Ireland between the Provisional Government and the Republicans Maurice Hayes was invited by the Government to organise an army medical service. He was appointed Director-General, with the rank of Major-General, and was so successful in his task that he was able to hand over a well-organised and equipped medical service to his successor after a tenure of office of only nine months. Hayes was a frequent contributor to the Royal Academy of Medicine in Ireland in subjects connected with X rays and radium, and many of his papers have appeared in the special journals.

In his younger days Hayes did notable work for the profession. When the National Health Insurance Act was introduced nearly 20 years ago he was appointed honorary secretary of the Dublin Medical Committees and later became secretary of the Irish Medical Committee. As such it fell to his lot not only to do the main work of organising the medical profession in Ireland, but also to conduct the protracted negotiations which finally led to a satisfactory settlement of the difficult problem of certification. The work which he did in this respect was not forgotten in Ireland, and when the Irish Free State Medical Registration Council was established in 1927, he was induced to go forward as a candidate for one of the positions as representative of the profession on the Council, and had no difficulty in heading the poll. His death will necessitate an election to fill the vacancy.

It will be seen that Dr. Hayes had a busy and active professional life. His work as a radiologist together with his duties as a university professor would have been enough for most men, and too much for many. But his sense of duty seldom allowed him to avoid or refuse a responsibility.

A personal friend of many years' standing writes: "In Maurice Hayes we have lost one of the most great-hearted and generous men I have known. He was full of ambition for the advance of knowledge and for the credit of Irish medicine, but of personal ambition he had not a trace. The most modest and retiring of men, loving privacy and hating publicity, it fell to his lot to fill more than one position of importance to his profession or to his country. With an unusually sensitive conscience in regard to himself he never looked for faults in others. One of the most devout of men in his personal life, differences of religion or politics meant nothing to him where judgment of men or where friendship was concerned. Generous in thought he was also generous in deed. His life and influences made many a man a better man. His death leaves many lonely."

MEMORIAL TO A MEDICAL MAN.—A cot in the children's ward of the Taunton and Somerset Hospital is to be named in commemoration of the late Dr. J. A. Macdonald, who was honorary physician.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

THE MENTAL TREATMENT BILL.

THE Mental Treatment Bill was further considered by Standing Committee A of the House of Commons on Thursday, Feb. 27th. Mr. CECIL WILSON was in the chair.

Power to Receive Voluntary Boarders.

On Clause 1, Lieut.-Colonel FREMANTLE moved in subsection (1) after the word "home" to insert the words "or training or other establishment," but withdrew and accepted the Minister of Health's suggestion that the words "or place" should be inserted after the word "home."

Mr. KINLEY moved in Subsection (1) to leave out the words "Board of Control," and to insert instead the words "Minister of Health." He said that as the Bill stood, voluntary patients were to be asked to go to an institution under the control of the Lunacy Commissioners. Their own doctor had no control, and the local authority and the Minister of Health had no control. That, he suggested, was the very opposite of what was intended.

A Destructive Amendment.

Mr. GREENWOOD said that this was an amendment of the most far-reaching importance, and its acceptance would mean the destruction of the Bill. Such patients as those mentioned by Mr. Kinley need not go to a lunatic asylum; they might go into a hospital or a nursing home approved for this purpose. While it was true that the Board of Control could go to one of these institutions and certify a person, it was also true that they could go there and see that a person was discharged if he was being improperly detained. As a matter of fact, the visit of the Board of Control was designed as one of the checks and one of the forms of protection for individuals who entered such an institution. The Royal Commission considered whether it was possible in practice to differentiate lunacy administration as a whole from the aspect of mental treatment with which they were concerned in this Bill, and considered that it would be unscientific to treat the different manifestations of mental illness under two distinct systems. The report went on to elaborate the case against attempting any clear-cut differentiation between the two methods of treatment. There appeared to be an assumption that this was the first time that the Board of Control had ever had anything to do with voluntary boarders, but such was not the fact. What this Bill did was to extend to public institutions a form of treatment which hitherto had been practically confined to certain private institutions; and if they looked at the figures they would see that the Board of Control to-day was in very large measure dealing with voluntary boarders who were not certified. During 1929 there were admitted to registered hospitals 562 certified patients and 668 voluntary patients.

Dr. VERNON DAVIES: Do those figures include Scotland?

Mr. GREENWOOD said that he was informed that they did not; and therefore his case was strengthened. During 1928, 974 certified patients were admitted to licensed houses, and 757 voluntary boarders, which meant that in those institutions to-day nearly half the people were not certified and were actually under the control of the Board. One had also to remember that these patients were not permanently in one category. If this Bill passed there would be three categories. First of all there would be the voluntary boarder; secondly, the person who had lost volition for the time being, but was not to be certified; and, thirdly, the persons who were certified as being of unsound mind. A person might pass from one of these stages to another, and obviously it was not possible administratively to change over from the Board of Control to the Ministry of Health when a man fell out of one category into another. They were not in this Bill dealing with substantial reforms of the principal Lunacy Act; they were trying to make special provision for people who had only been provided for in the past at the cost of certification, and incurring the pauper stigma. If the Committee insisted on substituting the Minister of Health for the Board of Control in this case, it would mean a complete overhaul of the principal Act, which was obviously impossible in this measure.

Prevention of Mental Illness.

Dr. DAVIES said that they all recognised that the Board of Control at present had a large number of voluntary boarders under its care, but he suggested that this Bill was going to change the whole outlook on this question. They were out for the prevention of mental illness rather than its treatment. Once the Board of Control came in, the association with lunacy would immediately be brought to the patient's mind, and the mind of his friends, and they would ask themselves whether the case was a border-line case, and whether the doctors out of kindness of heart were trying to avoid the stigma of lunacy being attached to the patient. One of the terrible problems of the present day was the large number of suicides. The total number of suicides in Great Britain in 1913 was 3791. In 1917 and 1918 the figures curiously enough came down to 2700 and 2600 respectively; but in 1919 and 1920 the figures were 3500 and 3600 respectively. From 1921 to 1928 the figures increased from 4000 to 4800. There was an increase for every year except one during that period. In 1927 the figure was 5100, and in 1928, 5356. He quoted a letter from Dr. G. M. Robertson to the *Times* as showing that it was the stigma of certification that had prevented certain cases on the border-line from submitting themselves to the present methods of treatment under voluntary control, and they had therefore become suicides. It was the fatal flaw of this Bill that these people were deterred from seeking early treatment because of their fear of inspection by the Board of Control. He was convinced that the intervention of the Board for these voluntary patients would wreck this part of the Bill.

Sir BOYD MERRIMAN thought that it was possible that there might be in certain cases abuse of any form of voluntary treatment, and it was absolutely necessary that there should be some form of control at every stage. It would be a profound mistake to take away the control of the Board in regard to these voluntary patients.

Mr. C. WILLIAMS opposed the amendment.

Mr. GOULD said he hoped the Minister would accept the amendment. They desired in this Bill to get a new health service treating these lighter cases of mental illness with a new psychology.

Provision for Voluntary Rate-aided Patients.

Miss SUSAN LAWRENCE (Parliamentary Secretary to the Ministry of Health) said that people with money who felt that their mind was going could go to a doctor as a voluntary patient under Section 229 of the Lunacy Act. They could go to a licensed house with the consent in writing of two of the Commissioners, which meant the Board of Control. What they were doing now was to extend to voluntary rate-aided patients almost exactly the same provisions as had been built up for those who could afford to pay. The Maudsley Hospital and another established under special Acts by the London County Council received lunatics. The Maudsley Hospital was under the Board of Control. Patients came in voluntarily, and she regretted to say that some of them passed into another stage and were certified. There was no reluctance to enter the Maudsley Hospital or the other registered hospital. The difficulty was to find accommodation for patients who wished to enter. This was a pure bogy; it was absurd to talk of separating the early mental cases from severe mental cases.

Dr. DAVIES: You do not put them together.

Miss LAWRENCE said that she meant that they needed the same doctors and staff. If these early cases were put in a special asylum they would not get good expert specialist service.

Mr. RHYS DAVIES said that the speech of Miss Lawrence had convinced him that the Bill was not the measure he thought it was to be. He never thought for a moment that the Board of Control was going to get greater control over these people than ever before. The Bill definitely put the voluntary boarder for all practical purposes in the same category as the certified lunatic.

Dr. MORRIS-JONES said that the Bill on second reading received universal assent, and passed without a division, but there were amendments on the Order Paper which were fundamentally opposed to the principle of the measure. If they were carried they would jeopardise the Bill.

Dr. HASTINGS said his own view was that people who were suffering from mental disease ought to be under the supervision of the Board of Control. Obviously they were the people who had experience in dealing with them, and they were also the people who would be able to see that the institutions were carrying out their duties in an efficient way. But another question had been introduced—namely, whether the hospitals or institutions in which the early cases were treated were in a definite connexion with lunatic asylums. That was a very doubtful point indeed, and he would be rather slow in accepting it. It was much better to have these people under the supervision of the Board of Control.

The amendment was negatived.

Other Amendments.

On the motion of Mr. GREENWOOD, an amendment was agreed to leaving out in Subsection (1) the words "with the consent of the Board into single care," and inserting instead the words :—

> " into the charge as a single patient of a person so approved, and any approval under this section may be granted subject to such conditions as the Board think proper and may be revoked at any time."

Subsection (2) of Clause 1 provides that parents or guardians may apply for persons under 16 to be received as voluntary patients.

Mr. Womersley moved an amendment substituting the age of 18 for 16. He said that the amendment was put down on behalf of the *Municipal Corporations Association.*

Mr. Greenwood said that in the original Bill the age was 18, but after a very full discussion in the House of Lords, it was decided to adopt the age of 16, that being the age at which a person could legally marry. Although he would have preferred 18, he did not think that it would serve any good purpose to re-open the whole question with the subsequent delays that would ensue.

The amendment was rejected by 33 votes to 4.

Mr. Greenwood moved an amendment to Subsection (2) providing that the written application should be made " to the person in charge."

The amendment was agreed to.

A further amendment moved by Mr. Greenwood, substituting the word " patient " for " boarder " was also agreed to.

Captain Gunston moved in Subsection (3) to leave out the word " person " (" a person who has been approved,") and to insert the words " medical practitioner." He said that he did this for the sake of clarity.

Mr. Greenwood said that it was clearly intended that the person should be the medical practitioner. but in order to remove any doubts he would accept the amendment.

The amendment was agreed to.

Lieut.-Colonel Fremantle moved an amendment to provide that the recommendation would have to be both by the Board of Control and by the local authority. He said he proposed this particularly at the instance of the Council of Mental Hygiene. The medical superintendents in their association would prefer that the local authority should not be given the power. It stood to reason that there might be some doubt whether the local authority would always in a personal consideration like this be absolutely wise in their decision. Therefore it was felt that the Board of Control should have a share in the appointment.

Mr. Greenwood said that he really could not accept this amendment. The authorities concerned were the responsible local authorities—the county councils and the county borough councils. He dare not ask them to submit to this ; they would be up in arms.

Lieut.-Colonel Fremantle said after the explanation of the Minister, although he did not agree with him, he would withdraw his amendment.

The amendment was withdrawn.

Sir Boyd Merriman moved in Subsection (5) to leave out the words :—

> " If any voluntary boarder by or in respect of whom such a notice has been given is not allowed to leave the institution, hospital, home or place at the expiration of the notice, he shall be entitled to recover as liquidated damages from the person in charge ten pounds for each day or part of a day during which he is detained."

He said that these were the words that settled the sum at £10 a day as liquidated damages for a voluntary patient who was retained after the 72 hours notice of desire to leave. He urged that the amount of the damages should be left to the court of law to which the patient would in any case have to go.

Mr. Greenwood said that he was inclined to think that £10 was an unnecessary limit in the case of wrongful detention. He would therefore accept the amendment, which was carried by 21 votes to 13.

The Committee adjourned.

The Mental Treatment Bill was further considered by Standing Committee A of the House of Commons, on Tuesday, March 4th. Mr. Scurr was in the chair.

Safeguarding the Proprietor of a Mental Institution.

Mr. C. Williams moved an amendment on behalf of Mr. Womersley, to the effect than any person received as a voluntary boarder should leave the institution, hospital, home, or place, upon receiving from the person in charge 72 hours' notice in writing requiring him to leave, or, if he was a person under the age of 18, upon such notice being given to his parent or guardian.

Mr. Greenwood (Minister of Health) said that the words of the amendment added nothing to the Bill, but they might lead to difficulty by relieving the owner of a private institution from liability for damages for breaking a previous agreement made with the patient or his relatives, if he had given 72 hours' notice.

Dr. Vernon Davies said that he thought they ought to put something in the Bill to safeguard the proprietor of a mental institution against a person who was not quite suitable for his establishment, and who refused to leave when requested to do so.

Dr. Morris-Jones said he thought there was something in the amendment. It was possible that they might get very obstreperous patients in these institutions, and the proprietor ought to be allowed to give such patients notice of discharge.

Miss Susan Lawrence (Parliamentary Secretary to the Ministry of Health) said that the persons who conducted these private mental institutions were men of considerable experience. They had the right to make any sort of conditions they pleased before they took anyone into their house. It was not a sensible thing to take out one condition in such an agreement, and put it into an Act of Parliament. Medical men of all people should be most chary of interfering with private arrangements between the patient and his doctor.

Mr. C. Williams suggested that the matter might be reconsidered before the Report stage.

The amendment was negatived.

Lieut.-Colonel Fremantle moved a further amendment to the effect that the person in charge should have power to admit or to discharge a voluntary patient, and to take steps to have such patient dealt with under the principal Act, or under Section 5 of this Act, with the approval of the Board of Control. He said that although this included the point dealt with on the previous amendment, it also dealt with an entirely different point. He had been asked to put forward this amendment by the Medical Psychological Association, representing the superintendents, the Medical Women's Federation, and the Council for Mental Hygiene. The object was to give a definite status to the person in charge.

Mr. Greenwood said that he could not accept the amendment which he thought was a piece of sheer bureaucracy. It meant that the person in charge was to be at liberty, if he so wished, to act quite irrespective and independently of any arrangements that might have been made by the authority responsible for the institution. He could not conceive that the local authorities would be in favour of this amendment.

Dr. Davies, in supporting the amendment, said that a patient in an institution might show himself to be undesirable morally, and the person in charge ought to be enabled to deal with such a case.

The amendment was rejected by 27 votes to 3.

A Strengthened Clause.

On the question that Clause 1 as amended should stand as part of the Bill.

Mr. C. Williams asked if the medical members of the Committee were satisfied that the position of the patients was now sufficiently safeguarded.

Dr. Vernon Davies replied that, speaking as a medical man, he thought the amendments inserted had definitely strengthened and improved the Clause. Although the Clause, perhaps, did not go as far as one would wish, there was every reason to congratulate the Committee on the changes which had been made.

Sir Boyd Merriman also expressed the view that the Clause had been improved by the insertion of the amendments.

The Clause was then added to the Bill.

Notice of Reception.

Clause 2 provides for notice of the reception, death, or departure of voluntary boarders, and for boarders who become incapable of volition.

Dr. Vernon Davies moved the omission of Subsection (1), which provides that where a person is received as a voluntary boarder, notice of his reception shall, before the expiration of the day next following the day on which he is received, be sent to the Board of Control by the person in charge. He said that the obligation to give notice to the Board of Control would prevent voluntary patients from submitting themselves for early treatment as the association of the Board of Control with lunacy was a very strong factor in the minds of these people. They might be wrong, but the idea was there, and it had to be reckoned with. He wished to delete the Subsection in order to encourage voluntary patients to go in at the earliest possible moment with the knowledge that they would in no sense be under the supervision, knowledge, or control of the Lunacy Commissioners.

Mr. Greenwood opposed the amendment. He said that a long discussion took place on the Board of Control last week, and the Committee could not re-open the matter. The Subsection was an essential safeguard to the liberty of the individual, and must remain as an integral part of the Bill.

The amendment was rejected by 55 votes to 7.

"Incapable of Volition."

Subsection (3) provides that if any voluntary boarder becomes incapable of volition, he shall not be retained as a voluntary boarder for a longer period than one month, but shall, on or before the expiration of that period, be discharged.

Sir **BOYD MERRIMAN** moved to substitute for the words "incapable of volition," the words "incapable of voluntarily submitting himself to treatment." He explained that this was the first of a series of amendments which dealt with an important point which he had raised on the second reading. The Minister of Health had indicated to him that he would probably meet this point by drafting an amendment to define the words "incapable of volition," and he (Sir Boyd Merriman) was anxious to hear exactly what the meeting proposed to do. As he had pointed out on second reading, the words "incapable of volition" meant to him as a lawyer that a man was completely mad.

Mr. **GREENWOOD** said that he thought that there was a tendency to attach too much importance to the form of words. Everyone, he thought, was anxious to get a proper understanding of what the words "incapable of volition" meant, and the most convenient way would be to leave the words as they were in the Bill, and to incorporate an amendment in the definition clause later on making it quite clear what "incapable of volition" meant. He would be prepared to do that.

Dr. **VERNON DAVIES** said that this was a very difficult part of the Bill, because medically it was not easy to define what "incapable of volition" really meant. He thought that the phrase required extending; it was too compact to meet the case

Dr. **MORRIS-JONES** said that medical men of very considerable experience in mental work had expressed to him dislike of the words "incapable of volition," principally on the ground that it was a matter of opinion and not of fact. These medical men had suggested to him that the words "indifferent as to whether or not he should or should not accept treatment," would be better.

Mr. **GREENWOOD** said that he did not see anything objectionable in the phrase "incapable of volition," but he agreed that it needed definition. He would be unwilling to accept the words suggested by Dr. Morris-Jones because they were not sufficiently precise.

Lieut.-Colonel **FREMANTLE** suggested that perhaps the Minister might accept the words "incapable of expressing willingness or unwillingness to receive treatment for mental illness."

After further discussion,

Mr. **GREENWOOD** promised to look further into the matter, with a view to finding alternative words for those in the Bill, or drafting a definition of the latter words which would meet the wishes of the Committee.

The Committee adjourned.

HOUSE OF LORDS.

WEDNESDAY, FEB. 26TH.

GOVERNMENT AND SLUM CLEARANCE.

The Bishop of **SOUTHWARK** called attention to recent annual reports of medical officers of health on bad housing conditions, and asked the Government to state when it was proposed to introduce legislation dealing with the slums. He alluded to the deplorable figures as shown in the last census, and, while welcoming the fact that 1,480,000 houses had been built in England, Wales, and Scotland during the last three years, believed that the slums were as overcrowded now as they were ten years ago. Since the war he said 139 slum clearance schemes had been submitted and 121 confirmed, but only 43 had been applied, and some of these were comparatively small. The medical officer of health in nearly all the reports which he had read laid emphasis on the seriousness of the situation, while as long as the shortage of houses continued it was not possible to put closing orders into force. He believed that on the average it took eight years to carry through a slum clearance scheme, while the man who had dwelt in the overcrowded house could not, as a rule, afford the rent charged for the better accommodation. His lordship went into the figures showing that the cost of construction including site and road charges made it impossible, even with the utmost economy to let a standardised house for less than 11s. per week. In allusion to a children's rent allowance, he quoted the following proposal: that when a man had not more than 50s. a week in wages, and had to support a wife and three children, he should be allowed a shilling a week off his rent for each child until the rent reached a figure of 7s. 6d. a week. There were serious objections to such a course. It would be said that this would mean an increase in the birth-rate among those who already had unduly large families. He was doubtful whether a shilling off the rent really entered into calculations in a matter of this kind, but he would remind their lordships that the census figures showed that fertility decreased regularly as the size of the house increased, until six or seven rooms were reached, and then it remained constant. The criticisms of this proposal were no doubt very serious, but it was difficult to see where else there could be found a solution of this extremely difficult problem how to provide for the men with small wages and large families, and he hoped that the Minister of Health, in preparing his Bill, would go very carefully into that question. He also hoped the Government would give them some assurance that their legislation to deal with slums would be introduced and passed this session.

Overcrowded Slums.

The Bishop of **LONDON** said he could bear witness that at the present time the slums were as overcrowded as they had ever been. A week or two ago he went to Fulham, and inspected 13 houses in what was supposed not to be the worst slum in that area. They were verminous and filthy, and there was one large family on each of the landings. Each house had been purchased for £150, and another £150 was being spent on making it self-contained, with separate sanitary arrangements for each family. The rent the tenants paid was equivalent to 2½ per cent. on the money which was borrowed to buy the houses and carry out the improvements. That was only an illustration of what could be done by a charity; the same thing was going on all over London. But these public utility companies were only a drop in the ocean. Any Bill which might be brought in ought to make it much simpler for the ground landlord, who often had to bear the imputation of owning bad property, to get at his property. Much more encouragement ought to be given to borough councils to use their powers to deal with the slums. What was wanted really was to rouse the conscience of the country.

Lord **DARYNGTON** said that only the Government could deal with the problem, while he disputed the common statement that if the slum population were moved into better houses they would turn them into slums again.

Decrease in New Houses.

The Earl of **ONSLOW** pointed to the depressing drop in the number of houses built during the last quarter of 1928 with, he added, a slight increase in their cost. He alluded to the opportunities which the reconditioning of houses presented, holding that new powers should be given to local authorities in that direction.

Lord **MARLEY** found the reports of the medical officers of health seriously disturbing to the Government. He referred to the recruiting figures at the beginning of the war, and to the incidence of tuberculosis on slum areas, and considered that the late Government had not used its big majority to assist local authorities to carry out clearance schemes. The present Government, he said, were considering whether they should alter the questions in the next census paper, so as to obtain information enabling them to visualise the problem better, remarking that the new Bill projected by the Government would simplify and shorten the procedure dealing with slum clearance. They would make provision for the necessary capital to deal with the cost of such clearances, and they would assist local authorities in the inspection of property, and its maintenance in proper repair. They were definitely prepared to encourage proper management of property in the replaced slum areas. They would also encourage the decentralisation of industry, and the removal of factories from closely populated areas into more rural areas where town-planning would ensure that they did not interfere with the amenities of the district. It was the intention of the Government to introduce their Bill in the House of Commons very shortly.

The Archbishop of **CANTERBURY** expressed satisfaction that Lord Marley had given reason for encouragement in the hope that long-deferred legislation was now impending. The progress that had been made hitherto in dealing with the slum problem had been lamentable.

The debate was adjourned.

HOUSE OF COMMONS.

WEDNESDAY, FEB. 26TH.

International Opium Convention.

Major **HARVEY** asked the Secretary of State for Foreign Affairs whether all countries had now signed and ratified the International Opium Convention of 1925; and, if not, whether he would give the names of those abstaining.—Mr. **HENDERSON** replied: Ratifications and definitive accessions to this Convention have been deposited on behalf of 31 countries. There are 11 other countries on whose behalf signatures or accessions have been given, but which still require, before they take effect, ratification or confirmation. Twenty-five countries have neither signed nor ratified nor acceded. The following is the answer:—

Ratifications or Definitive Accessions: Austria; Belgium; United Kingdom of Great Britain and Northern Ireland (including all Colonies, Protectorates and Mandated Territories); Canada; Australia; Union of South Africa; New Zealand, Western; Samoa; India; Bulgaria; Czecho-Slovakia; Free City of Danzig (through the intermediary of Poland); Dominican Republic; Egypt; Finland; France; Germany; Greece; Italy (for the Kingdom and Colonies); Japan; Latvia; Luxemburg; Monaco; Netherlands (including Netherlands Indies, Surinam and Curacao); Poland; Portugal; Roumania; Salvador; San Marino; Kingdom of Serbs, Croats, Slovenes; Siam; Spain; Sudan; Switzerland; Venezuela. *Signatures or Accessions not yet perfected by Ratification:*—Albania; Bolivia; Brazil; Chile; Cuba; Denmark; Hungary; Irish Free State; Nicaragua; Persia; Uruguay. *The Convention is open to Accession by:*—Abyssinia; Afghanistan; United States of America; Argentine Republic; China; Colombia; Costa Rica; Ecuador; Estonia; Guatemala; Haiti; Hejaz; Honduras; Iceland; Liberia; Liechtenstein; Lithuania; Mexico; Norway; Panama; Paraguay; Peru; Union of Soviet Socialist Republics; Sweden; Turkey.

The Gas Protocol.

Mr. HASLAM asked the Secretary of State for Foreign Affairs which States had now ratified the Gas Protocol.—Mr. HENDERSON replied: The following have either ratified or definitely acceded to the Geneva Gas Protocol: the United Kingdom of Great Britain and Northern Ireland; Canada: The Commonwealth of Australia; France; Germany; Italy; New Zealand; The Union of South Africa; India; Austria; Belgium; China; Egypt; Finland; Liberia; Persia; Poland; Roumania; Spain; Union of Soviet Socialist Republics; Turkey; Venezuela; and Yugoslavia.

Emigrants to Canada Rejected on Medical Grounds.

Mr. DAY asked the Under Secretary of State for Dominion Affairs the number of persons rejected during the previous 12 months by the Canadian Government doctors as unfit for emigration to Canada.—Mr. LUNN replied: The total number of persons rejected in this country on medical examination as "prohibited immigrants" under the Canadian Immigration Law during 1929 was 1289. In addition, 9523 persons were certified owing to physical defects as unsuitable, though not prohibited, migrants, but of this number 3436 were subsequently permitted to proceed, after the Dominion authorities had satisfied themselves that the arrangements for their settlement in Canada were satisfactory, and on Feb. 21st 431 were still under consideration. The total number of persons finally rejected up to that date was, therefore, 6945. The total number of persons examined was 86,793.

Cost of the Board of Control.

Mr. ROBERT RICHARDSON asked the Minister of Health what was the cost of the Board of Control for the financial years 1928 and 1929.—Mr. GREENWOOD replied: The total cost of the Board of Control was £84,987 for 1928 and £87,418 for 1929. Included in these figures are sums of £40,506 and £42,849 respectively representing the cost of State institutions.

Discharge of Mental Patients.

Mr. ROBERT RICHARDSON asked the Minister of Health if he was aware that the Cobb Committee appointed by the Board of Control made a recommendation that Section 79 of the Lunacy Act be posted up in the waiting-rooms of public asylums with a view to informing the friends of patients, in addition to their relatives, of their rights relating to applications for discharge of which they would have otherwise been in ignorance; and would he have this recommendation carried out.—Mr. GREENWOOD replied: There are objections to a general requirement that this section should be posted up in waiting-rooms. But the rules of the Board require the managers of every institution on the admission of every rate-aided patient to send a notice embodying the substance of Section 79 of the Lunacy Act to all persons whose names appear as relatives or friends of the patient on the statement of particulars accompanying the Reception Order.

County Councils and Orthopædic Treatment.

Lieut.-Colonel ACLAND-TROYTE asked the Minister of Health whether he was aware that Section 14 (1) of the Local Government Act did not give county councils the necessary powers to deal with orthopædic cases; and, seeing that they were unable to supply special nourishment, irons, crutches, &c., or treatment in clinics except under the poor-law, which was undesirable, whether he would give this question further consideration with a view to introducing legislation on the subject.—Mr. GREENWOOD replied: I am advised that under Section 14 (1) of the Local Government Act, 1929, county councils will be able to provide clinics for the treatment of orthopædic cases, and as part of the work of the clinics to supply all necessary appliances. I am also advised that as a rule orthopædic cases do not need special nourishment as part of treatment, and that exceptional cases in which this is required should receive treatment in hospital.

Baker's Dermatitis.

Mr. CECIL WILSON asked the Home Secretary whether he could give, for 1922, 1926, 1927, and 1928 the number of cases of baker's dermatitis; whether, as between the earlier and later years, there had been any marked increase; if so, what steps were being taken to arrest the increase; and from what date the disease became notifiable under the Workmen's Compensation Act.—Mr. CLYNES replied: The numbers of cases in which bakers obtained Certificates of Disablement under the Workmen's Compensation Act from the certifying surgeons in respect of dermatitis in the years mentioned, are as follows: in 1922, 102; in 1926, 334; in 1927, 375; and in 1928, 389. The last few years, therefore, show a marked increase as compared with 1922, but this may be largely due to the new Order which came into force in January, 1923, and which relaxed considerably the conditions under which compensation for dermatitis had previously been payable. The disease was first brought under the Act by an Order dated May 6th, 1916. The main precautions against the disease are, I am advised, care of the hands and arms and scrupulous personal cleanliness, and in order to promote this, a Welfare Order was made under the Factory Acts, and came into force in May, 1927, which, among other things, requires the provision in bakehouses of suitable washing facilities and the prominent display of the official cautionary notice as to the prevention and cure of dermatitis among workers handling flour and sugar. These provisions have secured improved conditions of work and a wider knowledge of dermatitis in the industry, and should do much to arrest the incidence of the disease. I understand, also, that coöperation is being given by a joint committee consisting of representatives of the National Association of Master Bakers, Confectioners and Caterers, and the Amalgamated Union of Operative Bakers and Confectioners, which, with the assistance of one of the medical inspectors of factories, has been considering the question.

Detention of Man as a Criminal Lunatic.

Mr. REMER asked the Home Secretary why William Sidebotham, charged at the Chester assizes on the charge of murder, had been removed to Broadmoor asylum as a criminal lunatic, when the coroner's jury had returned a verdict of accidental death; and why in this case a lunatic was retained as a criminal when the coroner's jury had brought in a verdict that he was not the cause of the death.—Mr. CLYNES replied: He was removed to Broadmoor because the Assize jury found him insane upon arraignment without determining the issue of commission of murder, and because the court ordered his detention until His Majesty's further pleasure be known. This is the course authorised long ago by Parliament, and never since seriously questioned. With regard to the verdict of the coroner's jury, it is not for me to comment upon the finding of any court.

Slum Clearance Schemes.

Mr. MCKINLAY asked the Minister of Health the number of working-class dwellings in England and Wales acquired for demolition under slum clearance schemes between April 1st, 1925, and Dec. 31st, 1929, and the number of new dwellings erected in connexion with such schemes.—Mr. GREENWOOD replied: Information as to the number of working-class dwellings acquired is not available. The number of buildings which would include some buildings other than houses, acquired by local authorities in England and Wales between 1st April, 1925, and 31st Dec., 1929, in connexion with approved slum clearance schemes was approximately 10,000, and the number demolished approximately 8000. The number of new dwellings erected during the same period in connexion with such schemes, was nearly 9000.

Certified and Grade A Milk.

Mr. CHRISTIE asked the Minister of Health whether he would state his reasons for issuing an order to all producers of Certified and Grade A (T.T.) milk, forbidding them to send their animals to agricultural shows; and whether he was aware of the slur which such an order cast upon pedigree stock whose world-wide repute permitted of a valuable British export trade.—Mr. GREENWOOD replied: It came to my notice that the conditions under which animals are housed at shows at which both tuberculin-tested and untested animals are exhibited, were such as to involve a serious risk of infection to the tested animals. I therefore informed the producers concerned that I could not in future consent to the temporary withdrawal of animals from licensed herds for the purpose of sending them to a show, unless the show is restricted to tuberculin-tested cattle. I may add that before coming to this decision I consulted my right hon. friend, the Minister of Agriculture, and also the Certified and Grade "A" (Tuberculin Tested) Producers' Association.

Panel Doctors' Prescriptions.

Mr. JOWETT asked the Minister of Health in regard to the resolution of the London Insurance Committee, requesting him to impose a fine of £100 on four panel doctors for prescribing for their insured patients drugs and dressings beyond the average, although the tribunal appointed by him to consider this charge found in no individual prescription evidence of irregularity or extravagance, and reported that these practitioners were actuated by high idealism and had organised an efficient treatment centre in a neighbourhood where the chances of maintaining health were poor, and added to their Report a recommendation that any penalty should not be more than a formal one, if he would decide not to impose a fine on these panel doctors.—Mr. GREENWOOD replied: The practitioners concerned have exercised their right to make oral representations on the question what amount of money, if any, should be withheld; and I cannot anticipate the decision at which it will be my duty to arrive, after receiving the report of the persons appointed by me to hear these representations. I must not, however, be understood to accept my hon. friend's references to the report of the referees in this case as being either a complete or an accurate summary of their findings.

Mr. MILLS: Is it not a fact that panel doctors in practically every insurance area are constantly in conflict with these committees?

No answer was given.

MONDAY, MARCH 3RD.

Evidence in Pension Appeals.

Mr. LAWTHER asked the Minister of Pensions if he would, in the rehearing of cases for pensions by either ex-Service men or widows, give facilities for appellants to put forward their evidence, whether medical or lay, and in any decisions that were against the appellant give the reasons why their claims had been rejected.—Mr. F. O. ROBERTS replied: I am not quite clear as to the class of case which my hon. friend has in mind. I may say, however, generally that no difficulty is ever placed in the way of the production of fresh evidence in support of a claim. With regard to the last part of the question, I would point out that in the nature of the case it is not usually possible to intimate more than that the information furnished has not been sufficient to establish the claim.

National Health Insurance Regulations.

Mr. RHYS DAVIES asked the Minister of Health if he had in contemplation any changes in the near future in the regulations governing medical and any other benefit under the national health insurance scheme; and, if so, if he would state when such changes would be placed upon the Table of the House.—Mr. GREENWOOD replied: Draft regulations with respect to the issue of certificates for national health insurance purposes by medical practitioners, and with respect to the definition of drugs for the purposes of medical benefit, are in preparation. I cannot yet say when these regulations will be laid before Parliament under Section 93 of the National Health Insurance Act, 1924; but before this is done, 40 days' notice will have to be given, under the Rules Publication Act, 1893, of the proposal to make the regulations and of the place where copies of the draft of them may be obtained.

Ex-Service Men and Effects of Gas Poisoning.

Mr. LAWTHER asked the Minister of Pensions if, in view of the increasing number of cases coming under the consideration of war pensions committees of discharged men suffering from tuberculosis and neurasthenia for which they were not receiving pensions, and in many cases furnishing evidence of gas during the war, he would consider setting up a special commission to investigate the possibility of tuberculosis developing many years after discharge due to or arising from war service.—Mr. SHEPHERD asked a similar question.—Mr. F. O. ROBERTS replied: In dealing with individual claims each of which is carefully considered, medical officers of the Ministry are always alive to any symptoms or history of gas poisoning. Moreover, the effects of such poisoning have been the subject of special investigations by medical experts both on the staff of the Ministry and outside. The conclusions arrived at do not support the suggestion made by my hon. friend the Member for Darlington that there is necessarily a connexion between exposure to gas and the subsequent development of tuberculosis. In present circumstances I do not think that a further inquiry of the kind suggested would be justified.

Mr. LAWTHER asked whether, as the War Office Committee which was considering these claims regarded the setting up of such a commission as necessary in order that the fullest opportunity should be given of reaching an understanding on the matter, the right hon. gentleman would reconsider his decision.

Mr. ROBERTS replied that he was willing to consider any suggestion in reference to the matter. The best medical advice that he could secure had been given to him, and on that he was bound to act.

Mr. OLDFIELD asked whether, in view of the great ambiguity which arose in discussing some of these gas poisoning cases, the right hon. gentleman would always give the benefit of any reasonable doubt to the applicant.

Mr. ROBERTS replied that that was already done.

Mr. EDE asked if the Minister had consulted the French medical authorities who were in charge of the gas-mixing factories in France during the war, and who held very strong views on the question of the delayed action of gas in relation to tuberculosis.

Mr. ROBERTS: No, Sir. I have not had a chance of consulting that authority, but I will certainly take advice about it.

Major COHEN asked if the authorities of the British Legion, at Preston Hall, who had made a special study of this question, had been consulted.

Mr. ROBERTS replied in the affirmative. He said that he had the report of those experts. He had read it on more than one occasion, and had it in mind when he gave his original answer that afternoon.

Employers and Health Data of Employees.

Mr. W. G. HALL asked the Minister of Pensions whether any changes had been made in the practice of obtaining, in connexion with the consideration of pension cases, information from employers as to a man's health during his employment.—Mr. F. O. ROBERTS replied: The practice referred to has been very carefully considered by me, and it has now been laid down that in any case where boarding is required on the initiative of the Ministry (other than cases of epilepsy and tuberculosis where the practice is discontinued altogether) it is made clear to the man that if he has definite reasons against asking his employer for this information he need not do so.

Medical Boards and Tuberculosis Cases.

Mr. W. G. HALL asked the Minister of Pensions to what extent the medical boarding of men suffering from tuberculosis was undertaken during the more favourable summer months; and would he inquire as to whether this operated adversely to the pensioner.—Mr. F. O. ROBERTS replied: The medical boarding of these cases, as of all other classes of disability, is distributed as evenly as possible over the whole year. The seasonal variations in the condition of a tuberculous case are fully appreciated and are always allowed for in the assessment of pension.

TUESDAY, MARCH 4TH.

Medical Officers as Sanitary Inspectors.

Mr. MCKINLAY asked the Secretary of State for Scotland whether his attention had been drawn to the growing practice in Scotland of appointing medical officers as sanitary inspectors; and whether he would take steps to see that fully qualified sanitary inspectors were employed who were specially trained for this important work.—Mr. JOHNSTON replied: The answer to the first part of the question is in the negative. As regards the second part, I am afraid I cannot accept the suggestion that a medical practitioner who is also the holder of a diploma in public health is unqualified for the office of sanitary inspector.

Medical Report on "Red Biddy."

Mr. MCELWEE asked the Secretary of State for Scotland if he had received the medical report on red biddy; if he would reveal its contents to the House; whether he had found that red biddy was produced in any other place than Leith; and whether it was consumed in districts other than the West of Scotland.—Mr. ADAMSON replied: The medical investigation into the effect upon consumers of cheap red wine, and of such wine when mixed with methylated or other spirits, will take some time. I am informed that red wine is manufactured at Cleland and at Perth as well as at Leith, and that the consumption of red wine, whether by itself or mixed with other ingredients, is not limited to the West of Scotland.

QUEEN CHARLOTTE'S HOSPITAL.—The Prime Minister recently lent No. 10, Downing-street for a musical party in aid of the rebuilding fund of this hospital. The proceeds amounted to about £500.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. J. McA. Holmes is placed on the Retd. List with the rank of Surg. Capt.

Surg.-Lt. M. Barton to be Surg. Lt.-Comdr.

Lt. G. E. Smith is placed on the Retd. List.

ROYAL ARMY MEDICAL CORPS.

Capts. G. E. MacAlevey (prov. and remains secd.) and C. P. Chambers to be Majs.

Lts. F. M. Collins (prov.), J. A. Chapel, and F. P. M. Anderson to be Capts.

Lt. (on prob.) R. R. Leaning is confirmed in his rank.

Lt. (on prob.) J. M. Gibson is secd. under the provisions of Art. 205, Royal Warrant for Pay and Promotion.

The undermentioned to be Lts. (on prob.): W. A. Y. Knight (secd. under the provisions of Art. 205, Royal Warrant for Pay and Promotion), and A. F. Kennedy.

G. T. Drummond is granted a temp. commn. in the rank of Lt., whilst empld. as a Dental Surg.

TERRITORIAL ARMY.

Lt.-Col. (Bt. Col.) W. Lister, from Gen. List, R.A.M.C., to be Col. and to be A.D.M.S. 49th (W. Rid.) Div., vice Col. F. Whalley vacated.

Maj. H. T. Bates to be Lt.-Col. and to comd. 146th (W. Rid.) Fd. Amb.

Maj. W. J. McIntosh M.B. (from R.A., T.A. Res. of Off.) to be Capt.

Capt. C. H. A. Alderton, having attained the age-limit, relinquishes his commn.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt.-Cols. J. F. Dobson, H. S. Beadles, and J. D. Comrie, having attained the age-limit, retire and retain their rank, with permission to wear the prescribed uniform.

ROYAL AIR FORCE.

J. Murphy is granted a temporary commission as a Flying Officer.

Flight Lt. J. P. Hederman is transferred to the Reserve, Class Dii.

Flight Lt. J. McM. Wilder relinquishes his permanent commission on transfer to the Indian Medical Service.

INDIAN MEDICAL SERVICE.

Col. J. D. Graham to be Maj.

Saiyed Wasiul Hassan Askari is granted a temp. commn. in the rank of Lt.

Maj. G. Y. Thomson retires.

Col. C. L. Isaac, Asst. Dir. of Med. Servs., 53rd (Welsh) Div., T.A., is apptd. Hon. Surg. to The King, vice Col. F. G. Proudfoot (retd.).

SOUTHPORT INFIRMARY.—The annual report states that the appeal for funds on behalf of the extension of this hospital has not secured adequate support. Up to the end of 1929, the total promises only amount to £6562, and of this amount £5031 has been received towards an expenditure of nearly £50,000. The total income for the year was £10,904, and the expenditure £18,420. The workpeople's contributory scheme realised £2687. The number of motor accident cases treated was 67. The total cost to the infirmary was £970, and of this amount £189 was received, leaving a loss of £780.

BIRMINGHAM HOSPITALS.—During 1929 extensions comprising 62 additional beds were made to Birmingham Children's Hospital, together with an isolation block for infectious cases, complicated with medical and surgical conditions, and for children extremely ill who have been in contact with infection, whose admission to the general wards would be a danger to the other children. The pressure upon the hospital is so great that in August last nearly 1200 children were awaiting tonsil and adenoid operations, and the general waiting-list of major operations numbered 400. In almost every department the work done has exceeded all previous records. A nurses' home and an infants' block are badly needed, and it is proposed that the former should be proceeded with at a cost of £45,000.—The Birmingham Hospital Saturday Fund has decided to build a new convalescent home for women in view of the fact that the demand upon the existing institutions is eight times the available accommodation. Last summer women had to wait for from five to seven weeks for admission.

Medical News.

UNIVERSITY OF LONDON.—Prof. L. T. Hogben, D.Sc., has been appointed as from August 1st, 1930, to the University Chair of Social Biology tenable at the London School of Economics.

Dr. Hogben gained a first-class in the Part I. of the Natural Science Tripos in 1915, and in 1921 he obtained the D.Sc. degree of London University in Zoology, and in 1922 he became Mackinnon Student of the Royal Society, and from 1922–23 Assistant Director of the Animal Breeding Research Department. From 1923–25 he was Lecturer in Experimental Physiology in the University of Edinburgh, and from 1925–27 Assistant Professor of Zoology at McGill University. Since 1927 he has been Professor of Zoology in the University of Cape Town.

Dr. Francis Davies has been appointed as from August 1st to the University Readership in Anatomy tenable at King's College.

Dr. Davies was educated at Cardiff University and continued his medical studies at University College Hospital, London, where since 1927 he has been Senior Demonstrator in Anatomy.

The Geoffrey E. Duveen Travelling Studentship in Oto-Rhino-Laryngology, of the value of £450, has been awarded for 1930 to C. S. Hallpike, M.B.

Mr. Maurice Webb, C.I.E., has been appointed Secretary to the Senate.

He was educated at St. Paul's School and at Corpus Christi College, Oxford. He has served for 25 years in the Indian Civil Service and has been Chief Government Whip in the Legislative Assembly under the Government of India.

Mr. S. J. Worsley, D.S.O., has been appointed Academic Registrar.

He was educated at the County School, Bodmin, at University College, Nottingham, and at King's College, London. In December, 1923, he was appointed senior secretary in the Academic Department of the University and Deputy Academic Registrar, and since March, 1928, he has been Deputy Education Officer, Hampshire.

The title of Fellow of University College has been conferred, among others, on Mr. Harold Muir Evans, surgeon to Lowestoft Hospital; who has carried out research on the Nature of Fish Venom; Mr. George Samuel Sansom, D.F.C., D.Sc., honorary Research Assistant in Embryology; and Mr. Gwynne Evan Owen Williams, F.R.C.S., Vice-Dean of University College Hospital Medical School.

The title of Honorary Fellow of University College, London, has been conferred, among others, on Prof. Henry Tonks, F.R.C.S., Slade Professor of Fine Art in the University.

INSTRUCTION FOR D.P.M.—The second part of the course for the Diploma in Psychological Medicine begins this week at the Maudsley Hospital, Denmark Hill, London, S.E.5. Lectures will be held until the end of May, and inquiries should be addressed to the Director of the Central Pathological Laboratory at the Hospital. A limited number of clinical appointments are available.

"LEICESTER CITY GENERAL HOSPITAL."—When, on April 1st, the City Council of Leicester take over North Evington Poor-law Hospital, it will be renamed the "City General Hospital." It is hoped that there will be between 100 and 200 beds available there to relieve the pressure upon Leicester Royal Infirmary, which always has a long waiting-list. The mental and senile cases will be removed elsewhere, and eventually 400 or 500 beds may be available.

A TOUR IN CZECHO-SLOVAKIA.—A tour through Czecho-Slovakia is projected in which a limited number of medical men are invited to participate, the intention being to visit certain medical spas as well as interesting centres from the historical and picturesque point of view. The start will be made on Monday, April 14th, from Liverpool-street, London, and the itinerary is timed so that the tourists will arrive back at that station on Monday, May 5th. The railway journeys in Czecho-Slovakia will mostly be made in a car at the disposal of the party, which will be hitched on and off the trains, but the first half of the trip may be made by automobile. Among the places mentioned to be visited, as well as Prague, are Teplice-Šanov, Marienbad, Pilsen, Lubačovice, Carlsbad, Jáchymov, and Franzensbad. Three days will be devoted to the visit to Prague, and it is suggested that the party may reach Macocha in Moravia, Brunn, Pištany, the Sonntag Sanatorium, and Tatras. The return journey is planned by way of Dresden. The total cost of the trip is estimated to be under £40, exclusive of the usual extras, and the travellers will be accompanied by an English-speaking doctor from the Czecho-Slovak Ministry of Health, and by a railway official who will be in charge of the luggage and the transport. Further information can be obtained from Mr. Henry Baerlein, the Bath Club, 34, Dover-street, London, W.

UNIVERSITY OF MANCHESTER.—Prof. F. E. Tylecote, F.R.C.P., has been elected Chairman of Convocation for the ensuing year.

OPHTHALMOLOGICAL SOCIETY.—To celebrate the fiftieth anniversary of this society a banquet will be held at the hall of the Fishmongers Company, London Bridge, at 7.30 for 8 P.M., on Friday, April 4th.

MACEWEN MEMORIAL LECTURE.—The second lecture under the Macewen Memorial Foundation was given at Glasgow on Feb. 28th by Sir Charles Ballance, who took as his title the Dawn and Epic of Neurology and Surgery.

HARVEIAN SOCIETY OF LONDON.—The Harveian lecture, entitled *Should Medicine be a Mendicant?* will be delivered by Prof. E. W. Hey Groves, of Bristol, at 8.30 P.M. on Thursday, March 13th, at 11, Chandos-street, Cavendish-square, and not at Paddington Town Hall as previously advertised. It is announced that visitors will be welcome

THE annual meeting of the Royal Medical Benevolent Fund will be held at the Rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, W.1, at 5 P.M. on Monday, March 10th. Sir Thomas Barlow, will preside. The annual report and statement of accounts for the year ended Dec. 31st, 1920, will be submitted, and the election of officials and committee of management for the ensuing year will take place.

APPOINTMENTS AT THE MINISTRY OF HEALTH.—We understand that the following medical men have been appointed to the staff of the Ministry of Health: Dr. Eric Donaldson, medical officer of health for Bognor urban district; Dr. Neil Robertson Beattie, chief assistant medical officer of health for Willesden urban district; Dr. Thomas Steven McIntosh, medical officer of health for Hendon; and Dr. Norman Fairbanks Smith, lately of the Kitchener School of Medicine, Khartoum, and of Madeira.

POST-GRADUATE NEUROLOGICAL STUDY.—Under the auspices of the American Medical Association of Vienna a special course in English will be held again this year, from June 23rd to July 31st, at Prof. Wagner-Jauregg's neuro-psychiatric clinic (of which the director is now Prof. Pötzl), and at the neurological institute of Prof. Marburg. It is proposed that the whole sphere of neurology and psychiatry and allied subjects shall be covered in 204 hours' instruction. Particulars may be had from Dr. E. Spiegel, Vienna I, Falkestrasse 3.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Particulars of the week's programme will be found in our Medical Diary. Two special courses start on Monday, March 10th. The first is a week's course at the Hospital for Consumption and Diseases of the Chest, Brompton, from 10 A.M. to 4 P.M. *daily*, and the second, at the Royal National Orthopædic Hospital until *March 22nd, begins with* operations each morning at 9 A.M. or 10 A.M. and includes out-patient clinics in the afternoon. Other courses beginning in March are as follows: *March 17th to April 12th*, neurology at the West End Hospital for Nervous Diseases, daily at 5 P.M. March 17th to April 12th, venereal disease at the London Lock hospital, every afternoon and *evening*; March *24th to April 12th*, medicine, surgery, and gynæcology at the Royal Waterloo Hospital, all day; March 31st to April 5th, *gastro-enterology* at the Prince of Wales's Hospital, Tottenham, all day. Copies of syllabuses and full information is obtainable from the Secretary of the Fellowship, at 1, Wimpole-street, London.

NORTH OF ENGLAND DERMATOLOGICAL SOCIETY.—The first annual general meeting of this society was held in Manchester on Feb. 7th, with Dr. Louis *Savatard, the President, in the chair.* The following officers were appointed for 1930:—President: Rupert Hallam. Vice-Presidents: G. H. Lancashire, R. Stopford *Taylor. Hon. Secretary:* P. Brooke Mumford. Other Members of Council: W. Dyson, J. T. Ingram, E. F. Skinner. Editor: L. Savatard.

DONATIONS AND BEQUESTS.—Among other bequests the late Mrs. Annie Davey of Falmouth, left £1000 to the Falmouth Sailors' Home and Hospital £500 to the Falmouth Cottage Hospital; £300 each to the Bristol General Hospital, the Bristol General Infirmary, the Bristol Hospital for *Women and Children*, the Bristol *Dispensary*.—Mr. James Hutchison, of Chilwell Beeston, Notts, who left £7042, gave £200 each to nurses who attended him at Barnes Convalescent *Home*, Cheadle, and after other bequests the residue of the property to the Medical Faculty of Glasgow University, "*my alma mater*."—Under the will of Mrs. Ann Moulds, of St. Helens-road, Leigh, Lancs, the whole of her estate, about £6000, has been bequeathed to Leigh Infirmary.—Lord Forteviot, of Dupplin Castle, Perthshire, left £10,000 to Perth Royal Infirmary.

ROYAL INSTITUTION.—At a general meeting on March 3rd it was announced that the managers had *elected* Mr. J. B. S. Haldane Fullerian Professor of Physiology in succession to Mr. J. S. Huxley.

UNIVERSITY OF LONDON MEDICAL GRADUATES SOCIETY.—The first meeting and dinner of London graduates resident in Manchester and district was held on *Feb. 28th* at the Midland Hotel, Manchester, with Sir StClair Thomson, the President, in the chair.

UNIVERSITY OF GLASGOW.—On March 4th Sir Donald MacAlister was installed as Chancellor of the University in succession to the late Lord Rosebery. Among those on whom he conferred the honorary degree of LL.D. was Sir George Newman, chief medical officer of the Ministry of Health.

LONDON HOSPITAL MEDICAL COLLEGE.—A course in Advanced Medicine suitable for candidates preparing for the M.D. and M.R.C.P. Examinations will begin on *April 28th. Further* particulars may be obtained on application to the Dean, Prof. William Wright, at the hospital.

RADIOGRAPHY OF TUBERCULOSIS.—The Joint Tuberculosis Council (Tavistock House, North Tavistock-square, London, W.C.1) have arranged a post-graduate course in the X ray department of the Hospital for Consumption and Diseases of the Chest, Brompton, S.W., from Monday, *March 17th, to* Saturday, the 22nd. The course will be conducted by Dr. Stanley Melville and others, and will be limited to 25 members. Details may be had from the hon. secretary.

CONGRESS ON PHYSIOTHERAPY.—The Fifth International Congress on Physiotherapy will be held from Sept. 14th to 18th at Liége, where the centenary of the independence of Belgium is to be celebrated at that time. Twenty-five countries have appointed national committees, and the chief subjects of discussion will be the *Rôle of* Physiotherapy in the Treatment of Rheumatic Disorders, Physiotherapeutic Treatment of Disorders of the Central Nervous System, and the University Teaching of Physiotherapy. Members of the Congress will be allowed to take part in the second annual meeting of the International League against Rheumatism, which is to take place at Liége from Sept. 18th to 20th. The hon. secretary of the British Section of the Congress is Dr. W. Kerr Russell, 126, Harley-street, London, W.1.

REDHILL HOSPITAL.—The annual report of the medical superintendent, Dr. J. Nissen Deacon, shows an increase in the work of this Edgware hospital at present belonging to the Hendon Board of Guardians, which was opened two years ago, and serves a district of some 50 square miles. It was intended primarily to meet the growing demand for the treatment of acute medical and surgical cases, and for maternity cases occurring amongst the sick poor of the Hendon Union. Last year the number of cases treated to a conclusion was 2565, an increase of 777. The number of surgical cases was more than double that of medical cases. Many of the casualties were traffic accidents, and 190 of them were fractures needing a long stay in the wards.

NEW PREMISES FOR MESSRS. H. K. LEWIS AND CO., LTD.—Under an agreement with the University of London, University College, Messrs. H. K. Lewis are erecting a new building on the side of 134, Gower-street, of which they will occupy the basement, ground and first floors, the three upper floors being occupied by the College, with a separate entrance and stairway from Gower-street. When this building is completed, probably by next year, it has been arranged that the Company shall use the whole of the building, while their old premises of 136, Gower-street and 24, Gower-place, are pulled down. On this site a new building will be erected by the company in general conformity with the new premises on No. 134, and the rest of the College buildings in Gower-street. A brief outline of the facts of the scheme will serve to contradict an impression that the familiar position on the corner of Gower-street and Gower-place has been parted with by the firm. While they are in occupation of No. 134 there will be many temporary difficulties to contend with, but plans are being carefully considered to ensure that these difficulties shall be overcome. But some sacrifice of space and convenience on the company's own site at the corner has been made to architectural necessities in order to secure a satisfactorily artistic effect in carrying out the general design. The scheme originated shortly after the late Prof. Simpson's retirement from the Chair of Architecture at University College, and he prepared the first plans. His son, Mr. J. R. Moore Simpson, A.R.I.B.A., has designed the building now to be erected.

A REGISTER OF SPAS.—At the annual meeting of the British Spas Federation, held recently in London, it was reported that an international and national register of spas of the world is being prepared under the ægis of the International Society of Medical Hydrology, the intention being to provide for all medical men the scientific and relevant data of each spa in such a concise form as will afford an easy method of comparison of their value. Analyses of the waters are to be expressed in standardised terms. The Federation, in support of this scheme, is instructing its members to arrange that all analyses be prepared in the prescribed manner.

It is stated that British spas generally report an increased number of visitors for treatment during 1929, and in several instances this increase was about 20 per cent. above the average numbers of the three previous years. Arrangements are being made for the immediate publication of a new medical handbook, available only for members of the medical profession.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

THE ROYAL SOCIETY, Burlington House, Piccadilly, W.

Thursday, March 13th.—4.30 P.M., The *following papers will be read*:—V. B. Wigglesworth: A Theory of Tracheal Respiration in Insects. (Communicated by Sir Walter Fletcher.) H. Raistrick, and others: Studies in the Biochemistry of the Lower Fungi. (Communicated by Sir Frederick Hopkins.)

ROYAL INSTITUTION, 21, Albemarle-street, W.

Tuesday, March 11th.—5.15 P.M., Dr. Charles Singer: Science in the Middle Ages.

Thursday.—5.15 P.M., Mr. J. B. S. Haldane: Some Problems of Genetics.

Friday.—9 P.M., Prof. G. Elliot Smith: New Light on Vision.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Monday, March 10th.—5 P.M., UNITED SERVICES. Major John Hare, R.A.M.C.: Ear Diseases in Relation to the Services.

Tuesday.—5 P.M., THERAPEUTICS AND PHARMACOLOGY. Preliminary Communication: Prof. E. C. Dodds and Dr. J. D. Robertson: Observations on the Therapeutic Effects of the Œstrus-producing Hormone. A discussion will follow. 8.30 P.M., PSYCHIATRY. Joint Meeting with the British Psychological Society. *Discussion on the Rôle of Psychotherapy in the Treatment of the Psychoses.* Speakers: Dr. H. Devine, Dr. Edward Glover, Dr. R. D. Gillespie, and Dr. H. Yellowlees.

Thursday.—8.30 P.M., NEUROLOGY. (Cases at 8.15 P.M.) Discussion on Injuries to the Brachial Plexus. Cases illustrating such injuries will be shown.

Friday.—5.30 P.M., CLINICAL. (Cases at 4.30 P.M.) Sir James Dundas-Grant: Vertigo and Epileptiform Seizures Completely Arrested by Ossiculectomy. Attic Cholesteatoma with Vertigo; Ossiculectomy. *Relief from Vertigo. Asthma in a Child* Relieved by Removal of Redundant Portions of the Middle Turbinated Bodies. Dr. C. Worster-Drought: Deformities of Hands and Feet Following Several Attacks of Acute Rheumatism. Mr. Cecil P. G. Wakeley: Endothelioma of the Pleura. Gumma of the Testicle. Dr. H. S. Stannus: Case of Tetany. Dr. Maurice Cassidy: Aneurysmal Dilatation of the Left Auricle. Atypical Leukæmia. Dr. F. E. Saxby Willis: Further Report on Case of Tumour of Lung. 5 P.M., OPHTHALMOLOGY. Clinical Meeting at Guy's Hospital (Ophthalmic Out-patients' Department), London, S.E. Mr. E. R. Chambers: Leontiasis Ossea. Other cases will be shown.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

Monday, March 10th.—8.30 P.M., Discussion on Cardiac Infarction, to be introduced by Dr. J. W. McNee.

MEDICAL SOCIETY FOR THE STUDY OF INDIVIDUAL PSYCHOLOGY, 55, Gower-street, London, W.C.

Thursday, March 13th.—8.30 P.M., Dr. Inman: The Psychological Aspect of Eye Symptoms.

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.

Wednesday, March 12th.—8 P.M., Prof. G. Elliot Smith: The Human Brain.

BIOCHEMICAL SOCIETY.

Friday, March 14th.—3 P.M. (in the Department of Physiology and Biochemistry, University College, Gower-street, W.C.) Communications: R. A. McCance and K. Madders, The Comparative Rates of Absorption of Certain Sugars from the Human Intestine. A. Hunter and J. A. Dauphinee, The Rate of Liberation of Arginine in the Tryptic Digestion of Proteins; A. Harden and and M. G. Macfarlane, Fermentation by Yeast Preparations. G. F. Marrian and P. F. Marrian, Microdeterminations of Hydroxyl Groups by Grignard's Reagent. G. F. Marrian, Further Observations on the Alcohol Isolated from the Urine of Pregnancy; An Improved Method for the Preparation of Œstrin—The Isolation of Active Crystalline Material from Urine. B. Ahmad and J. C. Drummond, Observations on the Relation of Carotene to Vitamin A. L. F. Hewitt, Oxidation-reduction Potentials of Cultures of Hæmolytic Streptococci. C. A. Ashford, The Phosphorus Distribution in Blood During Hypervitaminosis. R. A. Morton, I. M. Heilbron, and A. Thompson, Some Further Observations on Vitamin A. R. A. Morton and I. M. Heilbron, A note on the Vitamin A of Butter. T. Moore, The Conversion of Carotene to Vitamin A in vivo. F. Dickens, The Preparation and Properties of an Active Principle from the Urine of Pregnancy. K. H. Coward, K. M. Key, R. Morgan, and F. J. Dyer, Variation in Vitamin A Assay.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

Tuesday and Thursday, March 11th and 13th.—5 P.M., Dr. Donald Hunter: The Significance to Clinical Medicine of Studies in Calcium and Phosphorus Metabolism. (Goulstonian Lectures.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, March 10th, to Saturday, March 15th.—MEDICAL SOCIETY LECTURE ROOM, 11, Chandos-street, Cavendish-square, W. Tues., 4 P.M., Lecture by Mr. W. Girling Ball on the Differential Diagnosis and Treatment of Infections of the Urinary Tract. No fee.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Mon., 2 P.M., Demonstration (Gynæcological Operations) by Mr. J. Bright Banister. No fee.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Tues., 6 P.M., Demonstration (Dermatological) by Dr. J. E. M. Wigley.—HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton, S.W. Special Post-graduate Course in Diseases of the Chest, all day for one week.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, Great Portland-street, W. Special Post-graduate Course in Orthopædics, occupying all day for two weeks.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Special Post-graduate Course. Daily clinical work every afternoon and evening. Tues. and Thurs. *Further* particulars from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

Monday, March 10th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

Tuesday.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

Wednesday.—2.30 to 5 P.M.: Medical, Skin and Eye Clinics. Operations.

Thursday.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat, and Ear Clinics. Operations.

Friday.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases. Clinics. Operations.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James Hospital, Ouseley-road, Balham, S.W.

Wednesday, March 13th.—4 P.M., Dr. N. Bruce Williamson: The Arrhythmias in General Practice.

UNIVERSITY COLLEGE, Gower-street, W.C.

Monday and Wednesday, March 10th and 12th.—5.15 P.M., Prof. Otto Meyerhof: Chemistry of Muscle. (Last two lectures.)

Tuesday and Thursday, March 11th and 13th.—5 P.M., Prof. J. C. Brash: The Growth and Developmental Mechanics of Bone. (Public lectures.)

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, Gower-street, W.C.

Monday, March 10th.—4.15 P.M., Dr. Charles Singer: The History of our Knowledge of the Mechanism of Heredity.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark Hill, S.E.

Thursday, March 13th.—9 P.M., Dr. M. Critchley: The Chronic Epileptic.

ROYAL NORTHERN HOSPITAL, Holloway.

Wednesday, March 12th.—3.15 P.M. (at the Royal Chest Hospital), Dr. H. B. Day: Artificial Pneumothorax Treatment.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL.

Friday, March 14th.—4 P.M., Mr. Archer Ryland: Musculature of the Vocal Cords.

NATIONAL HOSPITAL POST-GRADUATE COURSE, Queen-square, W.C.

Monday, March 10th.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson: Neurotubercle.

Tuesday.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Bernard Hart: Disorders of Personality.

Thursday.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Purdon Martin: *Localising* Signs of Tumours in the Cerebral Hemispheres.

Friday.—12 noon, Dr. *Purdon* Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Walshe: Peripheral Neuritis.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

Tuesday, March 11th.—5 P.M., Dr. J. E. M. Wigley: Leukæmia Cutis, Mycosis Fungoides.

Thursday.—5 P.M., Dr. J. E. M. Wigley: Pemphigus and Allied Eruptions.

ROYAL DENTAL HOSPITAL OF LONDON, Leicester-square, W.C.

WEDNESDAY, March 12th.—6 P.M., Mr. I. H. Maclean: Rosenow's Theory of Elective Localisation: Its Significance in General Streptococcal Disease Associated *with Dental Sepsis.*

ANCOATS HOSPITAL POST-GRADUATE COURSE, Mill-street, Manchester.

THURSDAY, March 13th.—4.15 P.M., Mr. E. E. Hughes: Prostatic Enlargement.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, March 11th.—4.15 P.M., Dr. A. Ramsbottom: Enteritis with Pyrexia.

FRIDAY.—4.15 P.M., Mr. J. Morley: Demonstration of Surgical Cases.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

FRIDAY, March 14th.—3.30 P.M. (at the Royal Infirmary), Dr. A. B. Nutt: Eye Symptoms in Renal Diseases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

WEDNESDAY, March 12th.—4.15 P.M. (at the Western Infirmary), Dr. J. G. Macgregor Robertson: Venereal Diseases (Male).

Appointments.

BLACKWOOD, MARGARET, M.B., Ch.B. Glasg., D.P.H. Liverp. has been appointed Assistant Medical Officer of Health Barnsley.

CHANDLER, F. G., M.D. Camb., F.R.C.P. Lond., Assistant Physician to St. Bartholomew's Hospital.

NICHOLSON, RUTH, M.B., M.S. Durh., D.P.H., Hon. Surgeon to the Liverpool Maternity Hospital.

SAVIN, L. H., M.B., B.S. Lond., F.R.C.S. Eng., Ophthalmic Surgeon to the Metropolitan Hospital.

City of London Maternity Hospital: LOVE, R. J. MCN., M.S. Lond., F.R.C.S. Eng., Consulting Surgeon; CHARLES, H., L.R.C.P. Lond., M.R.C.S., and RICHARDS, H. A., L.R.C.P. Lond., M.R.C.S., Anæsthetists.

Vacancies.

For further information refer to the advertisement columns.

Albert Dock Hospital, Connaught-road, E.—M.O. At rate of £110.

All Saints' Hospital for Genito-Urinary Diseases, 91, Finchley-road, N.W.—Three H.S.'s. Each at rate of £150.

Aylesbury, Royal Buckinghamshire Hospital.—Res. M.O. At rate of £180.

Ayr County Hospital.—H.S. £150.

Barnsley, Beckett Hospital and Dispensary.—Jun. H.S. £140.

Barrow-in-Furness, North Lonsdale Hospital.—H.S.'s, each £150.

Bath, Royal United Hospital.—H.S. At rate of £150.

Bedford County Hospital.—Asst. H.S. £130.

Birmingham and Midland Eye Hospital.—Res. Surg. O. £150.

Birmingham, Dudley-road Hospital.—Jun. Asst. M.O.'s. All at rate of £200.

Birmingham Ear and Throat Hospital.—H.S. At rate of £150.

Birmingham General Hospital.—Res. Surg. Reg. £100–£20–£140.

Birmingham, Queen's Hospital Medical School.—Three H.P.'s. H.S. Anæsthetist. Also Dental H.S. Each £70.

Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £100.

Brighton, Royal Sussex County Hospital.—Hon. Clin. Asst. for Ophth. Dept. Also H.S. £150.

Burnley, Victoria Hospital.—H.P. At rate of £125.

Cambridge, Addenbrooke's Hospital.—H.P. Also Two H.S.'s. Each at rate of £130.

Cardiff Royal Infirmary.—H.S. to Ophth. Dept. At rate of £75.

Carlisle City.—Asst. M.O.H. £750.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Two Hon. Assts. to Out-Patient Dept.

Chester County Mental Hospital.—4th Asst. M.O. £350.

Colonial Medical Services.—Medical Officers.

Connaught Hospital, Orford-road, E.—Sen. Res. M.O. At rate of £150. Also Res. H.S. and H.P. Each at rate of £100.

Derby, Derbyshire Royal Infirmary.—Ophth. H.S. £150.

Dreadnought Hospital, Greenwich.—H.P. and H.S. At rate of £110.

Dudley, Guest Hospital and Eye Infirmary.—Asst. H.S. £150.

Edinburgh Hospital for Crippled Children.—Surgeon. £1000.

Edinburgh Royal Infirmary.—Tutor and Sen. Clin. Asst. for Ophth. Dept. £145.

Exeter City.—Asst. Tuber. O. and Asst. M.O.H. £600.

Freemasons Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Radiologist.

Great Yarmouth General Hospital.—H.S. £150.

Grocers' Company Research Scholarships.—Each £300.

Hertfordshire County Council, County Sanatorium, Ware Park.—Asst. M.O. £300.

Hospital for Tropical Diseases, Endsleigh Gardens, W.C.—Two H.P.'s at rate of £150.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W. Asst. Phys.

Hove Hospital, Sackville-road.—Res. M.O. £150.

Hove, Lady Chichester Hospital.—Jun. H.P. At rate of £50.

Hull Royal Infirmary.—Cas. H.S. At rate of £130.

Inverness, Northern Infirmary.—H.P. and Jun. H.S. £100.

Ipswich, East Suffolk and Ipswich Hospital.—Two H.S.'s. Each £120.

Kensington, Fulham, and Chelsea General Hospital, 194, Finborough-road, Earl's Court, S.W.—Res. Cas. M.O. At rate of £100.

Leeds Public Dispensary.—Jun. Res. M.O. £150.

Leicestershire and Rutland Mental Hospital, Narborough.—Med. Supt. £800.

Liverpool, Hahnemann Hospital, Hope-street.—Res. M.O. At rate of £100.

Liverpool Open-air Hospital for Children, Leasowe.—Jun. M.O. £150.

Liverpool, Royal Southern Hospital.—H.P., H.S., and M.O. Each £60. Also Cas. O. £100.

Liverpool, St. Paul's Eye Hospital.—H.S. At rate of £120.

London Hospital.—Director of Dept. for Venereal Diseases. £800.

Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Jun. Res. M.O. At rate of £50.

Manchester Royal Children's Hospital, Pendlebury.—Asst. Phys. £50.

Manchester, St. Mary's Hospitals.—Four H.S.'s to Special Depts. Each at rate of £50.

Manor House Hospital, Golders Green, N.W.—H.S. at rate of £200.

Middlesex Hospital, W.—Ferens Institute of Otolaryngology, Bernhard Baron Research Studentship. £300.

Newcastle-on-Tyne Hospital for Sick Children.—Jun. H.S. at rate of £100; also Res. Sen. H.S. and Res. H.P., each at rate of £95.

New Zealand, Auckland Hospital Board.—Med. Reg. Also Surg. Reg. Each £600.

New Zealand, Wellington General Hospital.—Radiologist. £900.

Nottingham City Infirmary.—Res. Med. Supt. £900.

Nottingham General Hospital.—2nd Cas. O. At rate of £150.

Poplar, Metropolitan Borough of.—Temp. Asst. to M.O.H. £600.

Royal Northern Hospital, Holloway, N.—Res. M.O. £200.

St. John's Hospital, Lewisham, S.E.—Res. H.S. £100.

St. Mary's Hospital, W.—Sen. and Jun. Clin. Assts. £100 and £50 respectively.

Salford City.—Jun. Asst. for Venereal Diseases Centre. £500.

Salford City Infectious Diseases Hospital.—Jun. Asst. Res. M.O. £200.

Salford Royal Hospital.—H.P., Two H.S.'s, also Cas. H.S. All at rate of £125.

Scarborough Hospital and Dispensary.—Two H.S.'s. At rate of £126.

Sheffield Royal Infirmary.—Ophthalmic H.S. At rate of £80.

Shoreditch Metropolitan Borough.—Asst. M.O.H. £650.

Southampton Children's Hospital and Dispensary for Women.—Res. M.O. At rate of £100.

Southampton, Royal South Hants and Southampton Hospital.—Jun. H.S. Also Cas. O. At rate of £140 and £130 respectively.

South London Hospital for Women, South Side, Clapham Common, S.W.—H.P., and 3 H.S.'s, each at rate of £50.

Stepney Metropolitan Borough.—M.O.H. &c. £1200.

Stirling District Mental Hospital, Larbert.—Jun. Asst. M.O. £300.

Stockport Infirmary.—Res. Surg. O. £250.

Truro, Royal Cornwall Infirmary.—H.S. £170.

Wakefield, Clayton Hospital.—Two H.S.'s. At rate of £150.

Walsall General Hospital.—Cas. H.S. At rate of £120.

West London Hospital, Hammersmith-road, W.—Hon. Asst. Surg., Hon. Med. Reg., and Hon. Obstet. Reg.

Westminster Hospital, Broad Sanctuary, S.W.—Sen. Res. and Cas. O. Also Asst. Med. Reg. At rate of £104 and £100 respectively.

Woolwich and District War Memorial Hospital, Shooters-hill.—H.P. and H.S. Each at rate of £125.

York County Hospital.—H.S. £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Morpeth (Northumberland) and Matlock (Derby).

Births, Marriages, and Deaths.

BIRTHS.

HUDDY.—On Feb. 26th, the wife of G. P. B. Huddy, M.S., F.R.C.S., of Dudley-road Hospital, Birmingham, of a son.

MACDONNELL.—On Feb. 23rd, at 89, Lower Baggot-street, Dublin (*Nursing Home*), the wife of J. J. MacDonnell, M.D., of Avoca, Hook, Surbiton, of a daughter.

SUMMERS.—On Feb. 28th, at a nursing home, the wife of Ralph D. Summers, M.R.C.S., L.R.C.P., of a son.

MARRIAGES.

BEAN—GOW.—At the Parish Church of All Souls', South Hampstead, London, on 26th Feb., 1930, Kenneth Dobing Bean, M.B., Ch.B., of Cheadle, Cheshire, second son of the late Rev. Benjamin and Mrs. Bean, of Homedale, Sutton, Surrey, to Kathleen Bruce, daughter of Allen Bruce Gow, Esq., of 66, Compayne Gardens, Hampstead.

DEATHS.

FRIPP.—On Feb. 25th, at West Lulworth, Alfred Downing Fripp, K.C.V.O., C.B., M.S., F.R.C.S., Hon. Surgeon to His Majesty the King and to H.R.H. The Duke of Connaught, Consulting Surgeon to Guy's Hospital, aged 64.

REDMOND.—On Feb. 15th, at Vancouver, British Columbia, William Redmond, L.R.C.S. Edin., L.R.C.P. Lond., late Fleet-Surgeon, Royal Navy, in his 91st year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

TYPES OF PERSONALITY, WITH SPECIAL REFERENCE TO INDIVIDUAL PSYCHOLOGY.

Remarks made during a Lantern Demonstration given to the York Medical Society on Feb. 8th, 1930,

BY F. G. CROOKSHANK, M.D., F.R.C.P.

THOSE who have the leisure, the opportunity, or the inclination to look away sometimes from the official, or academic medicine of the schools, the text-books, and the examination room, are aware of two distinct tendencies displayed by those now engaged in breaking new ground, or in clearing the jungle-growth that has encumbered old highways of medical thought. These will, in their turn, become orthodox and conventionalised, but for the moment they are better appreciated by those who are discontented with Established Medicine than by those who uphold the Establishment or form part of it.

In the absence of recognition of these tendencies by Established Medicine, there is bound to be increasing flight towards Christian Science, Osteopathy, Nature Cures, Mind Cures, and the like. This, already attaining imposing dimensions, will only be checked when Academic Medicine recognises that it has no greater claim to absolute validity than has Official Art, Official Theology, or Official Economics. Already the cry for our disestablishment is becoming heard, even in Parliament!

The *first* of the tendencies alluded to is towards revolt against the conventional system, in force since Linnaeus, of diagnosing in terms of what are called Diseases: that is, suppositious or clinical entities. The *second* is towards belief in the futility of any system of Medicine that, based upon necrological research in the post-mortem room and veterinary experimentation in the laboratory, totally neglects *human nature*—for that is what we *should* mean when we say "Psychology."

We have no right to speak as if *diseases* were the primary objects of our attention. Diseases only exist subjectively, in the mind like *Virtues*, and *Vices*: they are fictions we have invented for our special purposes. The "clinical entities" are the patients themselves, who are ill, in different kinds of ways and for different reasons. Particular cancers and broken legs and fatty livers have real existence, of course, just as have pretty mouths and ugly noses. But Cancer, Influenza, Pneumonia, and so forth, have no greater claim to be called *entities*, or objects in Nature with fixed characters, than have Beauty, Truth, Murder, and Lust. Still, while it remains true, as when Peter first said it, that *il n'y a pas de maladies; il n'y a que des malades*, the conventional method of diagnosing in terms of the fictitious entities we call Diseases has for many years been *useful*. It certainly was very useful so long as we could define Diseases in terms of morbid anatomy; it seemed to have long years of usefulness before it when it was thought that we would be able to define them all in terms of bacteria. It is still sometimes useful, just as it is useful for us to pay our gas bills on the basis of the fictitious entities the Gas Companies call therms. But, unless we can make up our minds in what terms, or how to define Diseases, it will soon become a source of great mental discomfort. I do not know one clinical teacher who cares to tell his students what "a Disease" really is, or how to distinguish one from a diathesis! The fact is, to adapt Bob Acres' aphorism: "Diseases have had their day."

Disease, of course, is always with us, and, if we wish to systematise our experience, some plan of classification must be adopted. And so we are beginning, almost insensibly, to go back to the scheme of diagnosis adopted by the Empirical School of Alexandria in the third century before Christ and, first recognising kinds of symptom-groups or *syndromes*, then proceeding to find out *why* in particular cases this or that rather than any other syndrome is manifested, without bothering about formal diagnosis by way of identification with a text-book type, like postage stamps from a catalogue. This, it seems to me, is the way of true diagnosis; in Galen's phrase, the thorough understanding of things present.

Now, it is precisely in the course of the attempt to make in this way an individual diagnosis—one, that is, not merely conventional or classificatory—that we come to appreciate the second tendency of which I have spoken. It is usual in making an individual diagnosis to attempt to assess in the first place whatever organic basis there may be for illness, and in the second place, what I will call the neuro-humoral element. But this is not enough. Diagnosis is not completed when we have summed up the clinical findings in terms of organic, bacteriological, humoral, or reflex pathology and ætiology, if we have not taken account of the patient's psychological history and make-up, and of the extent to which the clinical manifestations themselves may be psychogenic. I do not mean by this, to the mere extent that they may be fanciful, but to the full extent that humoral states and functional, if not organic manifestations, may be as truly psychogenic as are the tears we shed when we are sad, or as used to be the diarrhœa that afflicted some men in France at zero hour.

Individual Psychology of Adler.

We are, in fact, coming to see that we can never rightfully regard an individual as necessarily either an "organic" case or a "functional" one. The patient is always an individual, and all aspects of his individuality must always be considered. In this sense, then, every case is at once one of organic, of neuro-humoral, and of psychological importance. For this reason, I suggest to you that, of all the conflicting schools of psychology now in vogue, none has such claims on your attention as the Individual Psychology, founded by Alfred Adler, and developed by such of his pupils as Wexberg, Seif, Weinmann, and others. I will say something presently of the attitude adopted by physicians who are Individual Psychologists towards the mind-body problem, but I want now to emphasise that, as a result of the study of *syndromes* rather than *diseases*, and of our gradual realisation that syndromes are the ways in which kinds of individuals react, in kinds of circumstances, to kinds of stimuli, we are beginning to form mental images of *types* of *individuals*. Now, though we must only admit these *types* as fictions, or fictive ideals, and never as real existences, their recognition is useful and takes us back to the doctrine which distinguished the sanguine, the lymphatic, the pituitous, the bilious, and the atrabilious temperaments, as severally depending upon predominance of one or other of the corresponding humours. This typification in terms of temperaments had for its basis that firm belief in the *humoral* ætiology of Disease in which we still show confidence when we speak of toxins and of endocrine-gland balances. But humoralism as a doctrine of constitution is only a partial expression of the truth and although from time to time countervailing efforts were made to typify in terms of morphology or of *form* not much advance was made until, at the beginning of the Nineteenth Century, the *organicist* theory of Disease as dependent upon structural change came into fashion. Since then there have been many attempts to classify temperaments, or constitutions upon a morphological or anatomical basis.

In Table A (adapted from one drawn up by my friend, Dr. MacAuliffe of Paris) we have a conspectus of various schemes that have been put forward during the last 150 years, and I draw particular attention to the repetition in different forms of the very natural, straightforward, and convincing division into respiratory, muscular, digestive, and cerebral types, each characterised by predominance or superiority of one set of functionally associated organs. The cerebral type represents, of course, *homo sapiens;* the man whose adequate respiratory, muscular, and digestive symptoms are controlled by intelligence.

Sigaud's Classification.

This scheme, first put forward by Hallé, was given importance by Sigaud, a French provincial physician whose genius was unrecognised during his life-time, but who has given us the best definition of *disease* yet achieved. This definition (modified very slightly in translation) declares disease to be the dissociation of the functional unity of the individual. Sigaud's classification, then (as we may call it), is something more than morphological; in relating organ-form with functional capacity it accords with Sigaud's definition of disease. Now, when in any individual one system (such as the digestive) is dominant, another system (perhaps the respiratory) must be at least relatively inferior. In this case the inferior organ or system will be, as we say, susceptible; a *locus resistentiæ minoris*. Such an organ or system may break down, and become (as we say) the seat of disease. On the other hand, if the individual meets the inferiority with prudence and courage, development and compensation, of even a very high degree, may ensue. Sometimes, as it were, a middle course of compromise or neurosis is chosen and the patient manifests what is called *functional* disease in connexion with the inferior organ or system. But if a robustly organised system or organ, or functional capacity, is allowed to dominate the individuality, to strike the keynote of the style of life, the resultant lack of balance may itself become a factor in disease of the dominant system or function. Thus, while the child with the weak organ-system may, if encouraged, grow out of his weakness, or at any rate make the best of it, the man with a strong bellows may become emphysematous and bronchitic in later life; the athlete with the strong heart the subject of cardiovascular disease; and he with a sound belly the possessor of a huge liver, a fatty omentum, and an enormous colon. In the same way it is not the sexual weakling, but the sexual athlete, who becomes the impotent victim of locomotor ataxy.

This point of view—one of extreme importance—is given in Adler's doctrine of organ-inferiority which lies at the foundation of Individual Psychology.

But the Table which MacAuliffe has drawn up does not, as a matter of fact, show the correspondence between Sigaud's classification and his own notion of a division of human beings into *flat* or *dry* and *round* or *wet* colloidal types. This, which again combines humoral and morphological type-criteria, has been extended to the animal kingdom, and Wheeler in America has charmingly illustrated the point by drawing our attention to the contrasting species of insect, plump and round on the one hand, and slimly elegant on the other, belonging to the same genus.

Now, although the synthetic recognition of the functional biochemical, or humoral, and morphological, structural, or organic considerations of personality types in itself marks a great advance on more restricted conceptions, nevertheless, so far, we have no hint of the value of psychological correlations.

Nevertheless, in the work of Kretschmer, this element is admitted, and we are bound to find with him that there is on the one hand a definite alliance in many cases between the asthenic physical character and the schizoid mental style (which in disease passes into dementia præcox or schizophrenia), while on the other hand, the pyknic physical style seems the counterpart of the cyclic mental type which, in dissolution, passes into cyclothymia or manic-depressive insanity.

Now Kretschmer's asthenic schizoid is none other than the *type plat* of MacAuliffe, while his pyknic is as clearly MacAuliffe's succulent, blubbery, *type rond*. These two types, the flat schizoid and the round pyknic, have been fixed for all time in Don Quixote and Sancho Panza. The same antithesis is seen between Rodin's John the Baptist and a fat-bellied Chinese philosopher in Ming porcelain. Jung's introverts are on the whole of the former, and his extraverts of the latter type.

But carrying comparison a little further, it is very interesting to put in parallel, on the one hand the respiratory, the muscular, and the digestive types of Sigaud, and on the other three racial types: the lean Aryan, the muscular Negro, and the plump Mongol. I call the attention of veterinarians to the curious correspondence between Sigaud's first three types and the stock-breeder's classification of cattle into "asthenic" *milkers*, muscular *workers*, and bloated *feeders*.

Going still further afield, whatever orthodox anthropologists may say, there is a definite parallelism between the respiratory and racial Aryan and the chimpanzee (or gibbon); between the muscular negro and the gorilla; and between the digestive (or pyknic) Mongol and the orang-utan. The bearings of this observation, in Jack Bunsby's words, lies in the application of it. But the *truth* of the observation (which extends even to resemblances in posture) is now widely recognised, especially in Germany. This, however, is not all. Just as dementia præcox reveals the schizoid type in a sort of chimpanzoid regression, so we find some idiots of a brutal muscular "gorilloid" type that Langdon Down called Ethiopian, while the imbecile mongoloid is, as it were, an orangoid caricature of the pyknic and the racial Mongol. In a capital picture of a nude Japanese girl by Stratz, we note that her round figure form displays the very characters which, in the imbecile mongoloids amongst us, are wrongly taken to be "pathological."

Certainly one lesson seems gradually to emerge from comparative observations of this nature, and that is that racial types are not confined to geographical or political boundaries. We have in England mongoloids of high and of low grades; negroid types are found in China; Jewish in Burma; and so-called Caucasian in Central Africa.

Bearing upon Man's Origin.

What bearing these and other facts will ultimately be held to have upon theories of Man's origin it is impossible to say, but, if we adopt the Darwinian premises, we come, in their light, to hold views concerning the descent of Man which are quite irreconcilable with the mono-phyletic hypothesis of orthodox Darwinism. It may be that the poly-phyletic hypotheses of Klaatsch, Arldt, Sera, Frasetto, and others will be found satisfactory in part, at any rate. But recently interest has been aroused in France by the new theory of *Ologenism* expounded by Montandon, derived from the *Ologenesis* of Rosa. Ologenism suggests the simultaneous appearance in many different centres of anthropoid creatures, each branch or phylum dividing into two subordinate phyla, the one coming to early maturity, the other with retarded development. In this way Montandon explains how it is that the curious resemblances and differences and cross resemblances and differences between the geographical and political and anthropological groupings that we call *races* have come about. But the interest of this to us is that Montandon refuses to assert that there is any *necessary* correlation between physical type and cultural style. Here we come into touch with Individual Psychology, which insists that, although as observers we must recognise frequent mind-body correlations, we must not fall into the error of assuming the psychological style to be inevitably fixed by the physical character. I have said that an organ inferiority may terminate in either disease or in strength, while conversely an organ superiority may become a source of weakness. In a word, the individual (within limits, it is true, but within wide ones) has the *choice* of response to his somatic organisation. Individual Psychology emphasises a tremendous clinical truth in denying that our psychological style is necessarily dependent upon our physical make-up or our endocrine balance, in the way that certain writers pretend. It is nothing of the sort. We have deaf musicians like Beethoven, stammering orators like Demosthenes, myopic painters, and charming actresses whose facial handicaps are obvious. There are men who look like eunuchs and are not; athletes who would be thought virile and are impotent or homosexual. We know women who are beautifully feminine in face and figure and nevertheless without an iota of sexual or maternal feeling, while others, as we say, masculine in appearance, are most womanly at heart. In the same way, whilst many women feel themselves unsexed after ovariotomy or hysterectomy, as every gynæcologist knows, many who have been thus operated upon seem to be released from sexual inhibitions with the disappearance of the fear of pregnancy. Many women and not a few men whose thyroid glands make

TABLE A (*after MacAuliffe, with additions*).—*Showing Constitutional or Personality Types.*

Egyptian and Apocalyptic Symbolists.	Eagle.	Lion.	Bull.	Man.
Haller (1750)	—	Athletic.	—	—
Hallé (1797)	Thoracic.	Muscular.	Abdominal.	Cephalic.
Cabanis (1802)	—	Muscular.	—	Nervous.
de Troisvèvre (1821)	Thoracic.	—	Abdominal.	Cranial.
de Giovanni (1877)	Phthisic.	Athletic.	Plethoric.	—
Beneke (1878)	Microplastic.	Mesoplastic.	Euryplastic.	—
Sigaud (1908)	Respiratory.	Muscular.	Digestive.	Cerebral.
Bryant (1913)	Carnivorous.	Normal.	Herbivorous.	—
Stockard (1923)	Linear.	—	Lateral.	—
MacAuliffe (1925)	Type *plat*, dry.	—	Type *rond*, wet.	—
Bean (1925)	Hypermorph (?).	Mesomorph (?).	Hypomorph.	—
Kretschmer (1925)	Asthenic (schizoid).	Athletic.	*Pyknic* (cyclic).	—
Veterinarians	"Milkers."	"Workers."	"Feeders."	—
Endocrinologists	Hyperthyroid.	Hyperpituitary.	Hypothyroid (and pituitary).	—
Pathologists	Graves's disease.	Acromegaly.	Myxœdema. Froehlich's Syndrome.	—
Psychiatrists	Dementia præcox. Schizophrenia.	"Ethiopian" Idiocy. Schizophrenia.	"Mongolian" Imbecility. Manic-Depressive.	—
Ethnologists	Aryan.	Negro.	Mongol.	—
Anthropologists	Chimpanzee.	Gorilla.	Orang-utan.	—
Artists, &c.	Don Quixote. Calvin.	"Heavy-weights" (boxers).	Sancho Panza. Falstaff.	Greek Ideal.
Psychologists (Jung)	Introverts.	—	Extraverts.	—

obvious default escape treatment because they are mentally alert; and there are undoubted cretinoids and achondroplastics in both Houses of the Legislature. The fact is that, often enough, a physical shortcoming is made the excuse for a mental attitude which might otherwise be an incentive to the effort that *compensates* and *overcomes*. I do not say that there is *no* physical defect that cannot be overcome, but we may agree with Adler that it is certainly better to teach *as if* there be none. Ready acquiescence in the fatalistic doctrine of psychical determination by physical conditions is not only in opposition to unbiased clinical observation but leads to despair. The Darwinian philosophy of evolution by way of congenital variation, natural selection, and the survival of the fittest, is that of the pessimistic frog in the milk can, whilst the teaching of Lamarck (with which Individual Psychology has so much in common) is that of the optimistic batrachian in the same predicament who went on swimming and found himself ultimately on a pat of butter. If, then, it is true that there are certain correlations between physical type and psychological style, it is no less true that the individual has the choice between several possible reactions to the same stimulus, trauma, or defect.

Medicine the Study of (Maladjusted) Man.

Two lessons of real importance seem to emerge for our consideration. Medicine must be recognised to be, not the study of the false entities we call diseases, but a branch of anthropology—the study of Man. But it is a branch of anthropology which has to do with maladjusted man. We then find that, while it is useful to study types of mind and body, as we have been doing to-night, our real task in diagnosis is to comprehend the individuality of our patients, comprehensively recognising not merely their morphological types or states, and not merely their functional and neurohumoral values, but their psychological histories and life styles as well. In this way Medicine becomes much more than an affair of the dead house, the laboratory, or even the farmyard, and a matter of human interest.

If we get into the habit of reckoning the psychological values when making individual diagnoses, we shall be surprised to find how far we are led, even when dealing with what we call the specific infections but are better considered as individual responses to certain conditions! Thus, even phthisis turns out to have its origin, not in an unprovoked or casual assault by the bacillus but in the *discouragement* of the individual that slows and shallows his breathing and, as we say, lowers his vitality. Secondly, to adapt some famous words of Adler's, what matters is not so much the physical constitution or the environmental stage as the courage with which the difficulty is met. Indeed, there is no doubt that, though the Ethiopian may not change his skin nor the leopard his spots, those who behave in certain ways tend to change physically, in accord. Our endocrine balances are at least as, if not more, freely controlled by ourselves than are we by them. The psychical element is the *Primum Mobile* to which the "somatic resonance" is secondary. The physical is but the stalactite deposit left by the dripping water that, in dripping, may either form or wear away another stone. The *ultimate* physical make-up, indeed, of ourselves and the *primary* physical make-up of our children may be even far more than we think the consequence of our own decisions, and there is profound significance in the words of Jeremiah: "The fathers have eaten a sour grape and the children's teeth are set on edge."

List of Works.

1. Adler, A.: Problems of Neurosis, London, 1929.
2. Crookshank, F. G.: (*a*) Migraine and other Common Neuroses, London, 1926; (*b*) The Mongol in our Midst, London, 1925; (*c*) Der Mongole in unserer Mitte, Munich, 1928; (*d*) Diagnosis: and Spiritual Healing, London, 1927.
3. Draper, George: Disease and the Man, London, 1929.
4. Kretschmer, E.: Physique and Character, London, 1925.
5. MacAuliffe, Léon: Les Tempéraments, Paris, 1926.
6. Miller, E.: Types of Mind and Body, London, 1926.
7. Wexberg, Edwin: Individual Psychology, London, 1930.
8. Wheeler, W. M.: The Physiognomy of Insects, Quart. Jour. Biol., 1927, II., i., 1–36.

NEWLY IMPORTED PARROTS.

WRITING in the *Manchester Guardian* of March 1st the Marquess of Tavistock says that the recent outbreak of psittacosis appears to have been entirely confined to Amazon parrots. "For the guidance of inexperienced persons," he says, "I might add that the indications of an established bird are fully grown and unworn wing and tail feathers; and of a healthy bird, bathing, stretching, talking, screaming when not alarmed, and displaying by spreading the tail and contracting the pupil of the eye. The signs of a newly imported Amazon are worn, broken, or clipped wing and tail feathers; and of a sick one, silence, including complete abstention from talking, dirty and ruffled plumage, watery droppings, and a habit of sleeping with the head 'under the wing' and both feet (not one foot) on the perch.'

CONSUMPTION OF "RED BIDDY" IN SCOTLAND.

To the Editor of THE LANCET.

SIR,—Readers of THE LANCET (March 1st, p. 494) may have been somewhat "intrigued" by the question addressed to the Secretary of State for Scotland on the 25th of the past month as to the nature and use of an intoxicating drink known as "Red Biddy." In that wonderful "Enquire within," Martindale's Extra Pharmacopœia (19th edition, vol. ii., p. 26) is to be found R. E. Corder's account of it as given by him in the *Daily Mail* as follows:—

> "In Glasgow the bars close at 12 noon on Saturdays so that the shipyard worker may take home his wages, but they reopen at 5. The drinking dens are crowded. The popular tipple is '*Biddie*,' a deadly mixture of wine and methylated spirit. The red wine is bought at the less reputable bars at ninepence a quart bottle; and the methylated spirit, or 'feck,' as it is known here, is brought in and mixed with the so-called wine. The result is precisely the same as that seen in the New York drunkard. 'Red Biddie' is a devil's brew from a witch's cauldron. It makes the toper not so much drunk as doped. Glasgow police officers state that a man or a woman taken under the influence of 'Red Biddie' might be unconscious for 24 hours, and at the end of that period, if they take a drink of water or any other liquid, they immediately become drunk again. They are like subjects under a hypnotic trance. In whatever position their limbs are placed, so they remain."

Whether this interesting liquor is to be described as "*devil's brew*" *or as* "*wonderful value*" *depends entirely* on the point of view.

I am, Sir, yours faithfully,
London, March 3rd, 1930. JAMES DUNDAS-GRANT.

ELSIE INGLIS MEMORIAL HOSPITAL.

IN formally opening the Elsie Inglis Memorial Hospital, of which an account was given in our columns two years ago (THE LANCET, 1928, i., 730), Mr. Adamson, Secretary of State for Scotland, said that the Queen looked forward to paying it a visit on the first convenient opportunity. The hospital, which is within stone's throw of the Palace of Holyroodhouse (to give it the official title) is yet in the heart of a crowded quarter and the calls on it demonstrate the soundness of the managerial policy in placing it there. The outlook on the King's Park and Arthur Seat is superb.

At the opening the speakers included Dr. Maud Chadburn, of London, and Dr. Margaret Fairlie, Dundee, and in the evening there was a memorial dinner of 120 women, of whom 60 were medical.

"The Hospital," writes our Edinburgh correspondent, "grew out of the Hospice in the High-street. This was established on the initiative of Dr. Elsie Inglis long before the war and its success was phenomenal. But the Hospice, so long as it was used, and the new Hospital, have always been 'run by women for women.' This is the culmination of the long fight begun by Dr. Jex-Blake to secure for women a place in the Edinburgh profession; her own material memorial is the Women's Hospital at Bruntsfield."

SORE TONGUE.

A CORRESPONDENT would be glad to hear of treatment for recurrent attacks of sore tongue, commencing suddenly with enlargement of papillæ, and followed by minute ulcers on sides. There is no other inflammation in the mouth. and radiograms of the teeth are negative. A test-meal shows free hydrochloric acid. The attacks last about a week and intervals are variable.

SO-CALLED BIRTH-CONTROL CLINICS.

UNDER this title Dr. Marie Stopes sends us for publication the following warning, due to the iniquitous use of her name by a convict who recently received five years' penal servitude in connexion with the sale of abortionist remedies:—

"May I therefore emphatically warn everyone in the country that *no* pills, remedies, or anything of *any* commercial nature has any right whatever to the use of my name. I have *never* been associated even remotely with any such and condemn them utterly."

PARKING OF DOCTORS' CARS.—The Traffic Committee of the Cape Town Corporation reports that it has received a deputation from the Medical Association of South Africa, which submitted that practitioners should be allowed to park their cars in reserved areas close to consulting rooms, or alternatively that their cars, licensed as such and bearing a special badge, should be allowed to have kerbing and parking privileges one-third to one-half in excess of that of the ordinary. The committee replied that if special parking facilities in public streets were to be provided for any particular profession, claims would immediately be made by others for similar facilities. It refused the application.

ABSTRACT OF THE

Hastings Lecture

ENTITLED

HEALTH AND EMPIRE.

Delivered at the British Medical Association House on March 12th, 1930,

BY SIR ANDREW BALFOUR, K.C.M.G., C.B.,

DIRECTOR OF THE LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

[Sir Andrew Balfour, taking for his opening text the phrase "Bora afia," which means in the Swahili tongue "Health is the chief thing," commenced with a moving description of the risks and hardships of those who founded the British Empire by their enterprise and endurance, continuing :—]

If, in that great struggle for domination, too much account had been taken of sickness and pestilence, it is conceivable that the goal would never have been attained. Still, there is a great difference between a reasonable care of health and a reckless squandering of life, and time and again the latter was in evidence, and such knowledge as had been gained by bitter experience was cast into the melting-pot. Lest we forget, and with the view of contrasting the conditions which prevailed during the period of foundation and expansion with those obtaining to-day, it seems desirable to glance briefly at some of those perils to health which our forbears had to face. In doing so we can but wonder at the courage and tenacity which enabled the pioneers of Empire to triumph over disease and death, the while we deplore the needless loss of life, the lack of lore, and the short-sightedness which brought thousands upon thousands to an untimely end.

Let it be remembered that, until comparatively recently, the heart of the Empire itself was far from sound. In the spacious days of the Virgin Queen those who fared foreign encountered diseases with which they were quite familiar at home, though it is true they often encountered them in more terrifying guise than that to which they were accustomed. Unable to cope with them in the motherland, they were still less able to deal with them abroad and this, in certain directions, remained true until last century had run much of its course. England was scourged by cholera as late as 1866, and in 1869 relapsing fever was claiming victims in the poorer parts of London. In 1863 malaria formed the subject of inquiry, for it still persisted to a considerable extent in the fen lands and the marshes. One disease, not often seen ashore, but which dogged the mariner and the gentleman adventurer afloat was the sea scurvy which, until the addition of lemon-juice to the sailor's ration, played havoc with the personnel of the Navy and the mercantile marine. This was in the old days of sailing ships and long voyages, and before a simple and single remedy magically controlled it. Yet, although Hawkins saved his crews with lemon-juice in the Azores in 1590, it was not until 1844 that it was made a compulsory issue in the British Navy, despite all the efforts of the great naval hygienist, James Lind, in the preceding century and those of his disciples and fellow countrymen, Trotter and Blane.

THE PRICE OF WAR.

It is also worth noting, as showing how Empire building may favour the ravages of disease, at least when war is the trowel, that there were no less than 10,000 cases of scurvy amongst our Indian troops in Mesopotamia during the last campaign. Truly "Disease and Empire" would be a better title for this discourse than that which it bears. That such is indeed the case is shown by various happenings throughout the seventeenth and eighteenth centuries. It is, of course, impossible to deal with these in detail, but a few examples may be culled at hazard which indicate how correct was Lind, at least with respect to the Navy, when, in the Advertisement to his remarkable essay on the preservation of the health of seamen, he wrote: "For the number of seamen in time of war, who die by shipwreck, capture, famine, fire or sword, are but inconsiderable in respect of such as are *destroyed* by the ship diseases, and by the usual maladies of intemperate climates."

[The lecturer then referred his hearers to the pages of Roderick Random and to Smollett's account of the destruction wrought among ship's companies by yellow fever. Other pertinent references were to the account written by Charles Curtis, a naval surgeon, of the "Diseases of India as they appeared in the English Fleet and Naval Hospital at Madras in 1782 and 1783"; to Shield's graphic description of the Batavian epidemic of 1800; and to the letters of a certain Dr. Pinckard, physician to the Bloomsbury Dispensary, whose letters, sent home when serving with Sir Ralph Abercromby's expedition at the close of the eighteenth century, were published in 1806. Passing from the disasters due to diseases among the fleets and armies, Sir Andrew Balfour told briefly the story of the ill-fated Darien scheme, where disease proved as fatal as it did 200 years later, in almost the same spot, when attacking the original constructors of the Isthmus of Panama. He continued :—]

It must also be remembered that if, in the olden days, the Empire paid scant heed to the health of its white populations it paid even less to that of the native races which passed under its sway, except here and there in the case of slaves which possessed monetary value. Now, however, it has shouldered the white man's burden and throughout its length and breadth the care of the health of native communities is a feature of modern administration. What this means is not always fully realised. I have said elsewhere that a skilled and sympathetic doctor is more of a civilising and pacifying force than a company of infantry, and a well-run hospital has greater power in the long run than a battery of maxim guns. Some may be disposed to think this statement an exaggeration, and yet what do we find? The latest medical report from Fiji contains a chapter by Dr. J. M. Lambert on the work of the Western Pacific Health Service, in the course of which he says:

> "There is a certain amount of grim romance about our work in the Solomons. In October, 1927, on the savage island of Malaita, the District Officer, his white assistants, and numbers of native police were killed on a tax-collecting tour. A very few years ago, the answer to that might have been the punitive visit of a war vessel, a shelling of the district and indiscriminate killing of natives. On this occasion there was a painstaking arrest and a fair trial of accused participants. Within three months, also, the Government had two yaws and hookworm units at work on this island. The work has been continued there for the year except for a week or so, when they were transferred to another island because a rumour, which proved without foundation, said they were to be lured back into the hills and massacred. Immediately after they left, Malaita native delegations began to approach Government for their return, showing that only a few months of the work had given them an appreciation of the benefits received."

The change for the better began in this country, though there were not lacking powerful influences abroad and more especially in India which, under British rule, has, in certain respects, always been a remarkable centre of medical and hygienic activity. Yet it was the new outlook in England about the middle of last century, an outlook which resulted from the enthusiasm and the unremitting labours of Edwin Chadwick and his disciples, which laid the foundation of all that followed. The pioneers of sanitary reform preached the gospel of cleanliness and that comparatively simple evangel accomplished great things both at home and abroad. The gospel might be a simple matter, but its acceptance by those in high places and by the populace was very much the reverse, even when repeated cholera outbreaks came to the assistance of the reformers, and it needed the most dogged determination to effect a sanitary revolution. A lesser man than Chadwick would have given up in despair but, aided by Southwood Smith, Simon, and others of like kidney, he would not acknowledge defeat and well earned this fine tribute paid him in 1890 by another of his followers, Sir Benjamin Ward Richardson:

> "For so much labour on behalf of the health of this nation, and of all nations which profit by English industry, few public men of this century have received fewer public rewards or favours than this man who, born with the century, stands probably at the present moment of it, when compared with others of the same term of years, absolutely alone in the possession of ability, enthusiasm and genius. Happily no reward, no thanks can surpass those which have come so richly and so silently in the results he has lived to see as the fruits of his labours: *the foundation of a new* life-saving science; the gratitude of the best and wisest of mankind; the acknowledged baptism of an imperishable name."

What Chadwick and the other pioneers did was to place sanitation upon a sound basis, to invoke the majesty of the law on its behalf, and to make obedience to the laws of health an integral part of the life of the people. Naturally, when the efficacy of public health work had become established in Great Britain, those possessions which now constitute the great Dominions were not long in following the lead of the Motherland and putting their respective houses in order.

On the whole the problems to be met and mastered in Canada and New Zealand resembled very closely those which this country had to face in its efforts to secure sanitary salvation, but South Africa and Australia had special troubles of their own. Thus, from 1889 onwards South Africa had to cope with plague and, of late years, its plague problem has assumed special features and has presented peculiar difficulties owing to the infection of the veldt rodents. In Australia, and also in New Zealand, the prevalence of hydatid disease, due to a parasitic worm, has introduced questions and measures which are unfamiliar in the old country; plague in Australia was at one time a cause of trouble and expense; while the fact that a considerable part of the Australian continent is within the tropic zone has necessitated attention being paid to the matter of acclimatisation and to the prevention and cure of ankylostomiasis. In both South Africa and Australia the leper problem had to be faced, so that in both these Dominions conditions were somewhat specialised.

It is, however, only when we turn to India and the Colonies, for the latter are nearly all tropical, that there is impressed upon us the fact that, until science had led the way, the physician was terribly handicapped in his efforts to cure disease, while the hygienist was also hampered and perplexed, although it is true that, by following the lines indicated by the pioneers and adopting cleanliness as his slogan, he was able to accomplish much in the way of prevention and amelioration. It was not always necessary to wait until sundry parasites had been discovered, certain vectors of disease identified, some life-cycles of lowly organisms worked out before remedying the conditions.

To do this country justice, she usually cleaned up places on which she laid her claws, at least after she had learned to keep herself clean, or, in view of present conditions, should we say fairly clean?

THE DAWN OF TROPICAL MEDICINE.

Yet, viewing the situation broadly, it may with truth be said that it was not until the new era of tropical medicine dawned, with its surprising revelations and its vistas of hope and of health, that any remarkable progress was made either from the purely medical or from the purely sanitary standpoint. Perhaps the most outstanding example of results following upon the heels of research is to be found in what occurred at Malta. The organism of undulant or, as it used to be called, Malta or Mediterranean Fever, had been discovered by Sir David Bruce in 1888, but it was not until 1905–06 that a Commission of the Royal Society investigated the problem of a malady which was a veritable curse, for, though it did not kill many sailors and soldiers, it kept large numbers of them in hospital and led to prolonged disability. The loss in personnel and in money was indeed very serious. The labours of the Commission, following the lead given by Dr. Zammit, of the Malta Board of Health, who was himself appointed a member of the Commission, conclusively proved that the path of infection lay through the goat. In other words, the milk of infected goats transmitted the disease to man. Precautionary measures were at once taken, and within a year the disease had been practically eradicated from the Navy and Army.

Let it be clearly understood, however, that we must not attribute all the advance of recent years to discoveries like those of Theobald Smith on Texas Fever, Bruce on undulant fever and trypanosomiasis, Manson on filariasis, Ross on malaria, and so forth. Other factors were at work, such as the realisation of the value of the tropics as a source of raw material for the Empire, improved transport both by sea and land, improvement in the diffusion of information, greater interest in native races, the strategic importance of certain places from a military and naval standpoint, better food conditions, more comfort and a lessened consumption of alcohol. In short, the tropics in one sense became the fashion. European nations and even the United States scrambled for them and, as vested interests developed, so did the necessity of spending money and of educating the indigenous populations.

INDIA AND AFRICA.

Under such circumstances it is clear that India could no longer tolerate conditions like those which obtained in former times when, as Dr. Busted tells us, the white citizens of Calcutta were wont to meet after the rains under the great Banyan tree in the Maidan and congratulate themselves that they were still alive. As a matter of fact, India had already passed far beyond this stage for, as has been stated, she had been well served by medical officers and research workers, both in the Indian Medical Service and the Army Medical Service, and had benefited especially from the light thrown upon the method of spread of cholera by John Snow in London, von Pettenkofer in Munich, Bidie, Parkes, Duncan, and others in India, as well as by Koch's discovery of the cholera vibrio, the cause of the disease. Moreover, in the case of the large European cities money had not been lacking even for those Cinderellas of municipal expenditure, sanitary improvements, so that by the time research began to clear up some of the more important mysteries in tropical pathology, India was on rather a different footing from the other parts of the Empire. Whether she made the best use of her advantages in this respect is quite another question, but it must always be remembered that in India health problems are on a vast scale and that the difficulties are enormous.

Under the process of settlement and expansion the dreaded West Coast of Africa could no longer remain the white man's grave, as it had with justice been called throughout the eighteenth and much of the nineteenth century. No longer was it conceivable that the average tenure of office for Government officials should be less than 12 months. No longer was there any need for a judge to devise the ingenious expedient of making his home on a small vessel moored off the coast and going ashore only to carry out his official duties. No longer could the gravestones in the cemeteries and the memorials in churches be permitted to exhibit record after record of unfortunate persons who had perished under the age of 40. Civilisation altered the situation, and it is worth noting that the British Empire as a civilising and colonising Power has been a good ally to health. At least, we may say that the balance is on the right side for, of course, this very process of trade expansion and settlement has resulted in terrible tragedies. Diseases have been introduced which have decimated native populations. Think of the malign influence of the slave trade in which Great Britain for so long participated, the horrible state of the slave ships in which, too often, dysentery and ophthalmia were rife, the probability that yellow fever was introduced into the New World by this iniquitous traffic. Still, when all is said and done, imperial development has, on the whole, brought about hygienic improvement, and incidentally I may say that, personally, I believe this process of "bonification," as the Italians call it, will prove the main factor in conquering such diseases as malaria and African sleeping sickness. Yet those researches to which allusion has been made, or at least some of them, had an influence apart from their intrinsic value. Once the rôle of the mosquito as the vector of the parasite of malaria had been demonstrated and the truth of Manson's malaria-mosquito hypothesis established by the labours of Ross, a wave of intense interest and of hopefulness passed over most of those associated with the tropics, though, as ever, scoffers were not lacking. There was something romantic about the idea, and the discovery seemed to hold out vast possibilities. Attention was thereby drawn to tropical latitudes and, in fact, the very controversy which arose proved beneficial. A similar and even greater outburst of enthusiasm, at least in certain circles, followed the American proof that the virus of the dreaded yellow fever was mosquito-borne, and the demonstration by Gorgas in Havana that the new knowledge had placed in our hands effective methods of prevention and control. Much the same stimulation resulted from the finding that the tsetse-fly—known to the British public from the writings of David Livingstone, was responsible for the spread of that negro lethargy or sleeping sickness, the nature of which had been for so long a time enveloped in mystery, and which had wrought such havoc on the shores of the Victoria Nyanza.

It was clear that at last we were getting to grips with those tropical maladies which had been one of the chief factors preventing the opening up of Africa and the exploiting of other regions, some of vast potential wealth, within the torrid zone.

[The lecturer then considered the home land in its imperial relationships, and pointed to the ignorance of the public, as a whole, as to the system of information whereby the Ministry of Health and the Colonial Office are notified about infected ports. He recalled the difficulties due to the country not being self-supporting in the matter of food, and finally referred to the lack of education of the public in respect of health problems. After referring to the incidence of dysentery, small-pox, and other scourges, as well as tuberculosis, malaria, and venereal disease, he closed his address with the following testimony to the value of education in hygiene and tropical medicine:]

Education in Hygiene and Tropical Medicine.

Turning now to the education of those specially charged with the preservation and restoration of health, there is a movement afoot to permeate the medical curriculum, as Sir George Newman puts it, with the preventive idea. It has made greater progress in the United States than in this country, but let us hope it will not be abandoned, for it is a sound conception, difficult of execution no doubt, but withal essential, if the doctor of the future is to be a trusted and valued ally in health campaigns. The establishment of the London School of Hygiene and Tropical Medicine marked the commencement of a new era in post-graduate public health education in this country and it has also an imperial aspect, the full significance of which will only be apparent as the years pass and more and more of those trained on new and approved principles take their places in the fighting line both in this country and overseas.

To Manson we owe the idea of special schools in England for training the medical man and woman in the control and care of diseases of the tropics or ever he or she fares foreign. London and Liverpool have done much in this direction in the past and the University of Edinburgh, always a pioneer in matters of medical education, has recently reorganised and extended its courses of instruction in tropical medicine and hygiene. An important development in connexion with the London School is the institution of courses in tropical hygiene for laymen and laywomen. Those who attend them will not enter upon tropical life unprepared and will exemplify the truth of the saying, "forewarned is forearmed."

The value of the graphic museum as a means of demonstrating all that "Health and Empire" connotes has been recognised at the London School and also at the Wellcome Bureau of Scientific Research, while it is gratifying to note that museums of this kind are springing up here and there in the Colonies where, properly conducted, they cannot fail to assist the great cause.

Hospitals for tropical diseases, like that of the Seamen's Hospital Society, play an honourable part, not only by helping the sick, amongst them many servants of the Empire, but by providing clinical material for teaching purposes and by quickening the interest of many in the welfare of our tropical possessions.

Despite the influx of medical men and women into our tropical possessions the old cry still holds good, "What are they amongst so many?" and hence we view with sympathy the extension to Africa of a system of medical training for the native which has proved its value in Ceylon, Singapore, and Fiji. This, again, is imperial work and cannot fail of its effect if only it be carefully and faithfully prosecuted, as would appear to be the case in Khartoum, where good progress is reported.

Lastly, mention should be made of the useful and widespread activities of the Royal Sanitary Institute, both at home and abroad, in the way of training and examining those desirous of becoming sanitary inspectors and thus constituting themselves links, and very valuable links, between the medical officer of health and the population for whose welfare he is responsible.

Research.

And now as to research, that much abused word and yet that weapon which, wisely wielded, has opened up and can open up for us paths in the jungle of ignorance, dispelling darkness and gloom and revealing vistas of hope and cheerfulness which, in their turn, conjure up visions of health and longevity.

In Great Britain there are many centres of research, but I will refer only to the ceaseless and ever-increasing investigations of the Medical Research Council, which have already resulted in discoveries, some of which are of vital importance to the health of the Empire. It is surely a fascinating thought, as Sir Walter Fletcher has said, that at any moment some piece of work in the laboratory or in the field in this country may profoundly influence communities existing under totally different conditions thousands of miles away. Yet it is true, and so is the converse, for research is proceeding in many parts of the British Empire. Moreover, serious efforts are being made to coördinate it. India was somewhat of a pioneer in this matter so far as research work within her own vast territory is concerned, and now the report of the Fletcher Commission has indicated further and, presumably, better lines of development. To help research in the Colonies a special Colonial Medical Research Committee has been established and is beginning to make itself felt.

Indeed, in every direction we can chronicle activity, if not marked progress, but it is necessary to sound a note of warning. Research has outstripped practice. We are not applying properly much of the knowledge we of the cerebro-spinal fluid is of the utmost importance in the investigation of the problem of the ætiology of disseminated sclerosis. Observations on the cerebro-spinal fluid were the starting-point of the investigations which form the basis of this present research on disseminated sclerosis. In 1926 I carried out research to investigate the causation of the colloidal gold reaction in cerebro-spinal fluid from patients suffering from various diseases. It was found that in the case of disseminated sclerosis the cerebro-spinal fluid may appear normal according to the usual laboratory tests, but more often it shows two pathological changes, occurring either independently or together—namely, a positive globulin reaction in about 40 per cent., and a positive gold-curve in approximately 77 per cent. of cases. The colloidal gold test, therefore, assumes particular significance in disseminated sclerosis, since it is often the only abnormality demonstrable in the routine examination of the cerebro-spinal fluid, and it seemed probable that if the causation of this reaction were determined, valuable information would be obtained as regards the ætiology of the disease.

Experimental Investigations.

The gold test has been carried out in 189 cases of disseminated sclerosis. Seventy-seven per cent. of these gave positive gold-curves, specific curves being obtained, characterised by colour changes within certain dilution zones.

The colloidal gold was prepared by the following method: To a boiling solution, consisting of 100 c.cm. of distilled water and 1 c.cm. of a 1 per cent. solution of gold chloride, are added 9 drops of a 2·5 per cent. solution of formalin. Fifteen seconds later, 15 drops of a 2 per cent. solution of potassium carbonate are added. If necessary, a further 1 to 3 drops of the latter solution are added after an interval of 15 seconds. Not more than 18 drops altogether are added, and the solution must be kept boiling all the time. The colour change must be instantaneous. Five c.cm. of this solution should be completely precipitated in one hour by 1·7 c.cm. of a 1 per cent. solution of sodium chloride. The gold solutions used were titrated by using sodium chloride as a precipitant, according to the method described by Novick.[16] Such accurately standardised gold only was employed. Colloidal gold solutions should not be used for 12 to 24 hours after being prepared, but should not be more than seven to ten days old, since the reaction after this period becomes more alkaline, and the gold consequently less active.

The various precautions necessary in the preparation of colloidal gold solutions and the actual test are described in numerous papers on the subject, and need not be discussed in this preliminary communication. It is only necessary to point out that dilutions of cerebro-spinal fluid varying from 1/10 c.cm. to $1/10 \times \frac{1}{2^{(n-1)}}$ c.cm. in an *n* series of tubes, were employed in the experiments described in this paper. The final reading should be taken 12 to 18 hours after performing the test, but frequent observations of the tubes are necessary to ascertain in which tube precipitation first occurs. The results showed that in disseminated sclerosis there is one important diagnostic point about the gold-curve revealed by such observation of the tubes—namely, that precipitation almost invariably occurs first in the fourth tube, that is, in the dilution 1/80. Whatever the final reading, this change can usually be observed within an hour of doing the test, although at first the precipitation may be very slight.

It was found that in 70 per cent. of these cases giving a positive gold-curve precipitation occurred in the dilutions 1/80 to 1/640, producing a curve of the type 00032222000. Initial and usually maximal precipitation was manifest in the 1/80 dilution. In certain stages of the disease the cerebro-spinal fluid gives a type of curve in which precipitation occurs in the first five or six tubes. In either case the degree of precipitation is usually not greater than that indicated by the figures 3 or 4. Complete precipitation is rarely seen. The type of reaction (*Verschiebung nach oben* or *Rechtsverschiebung*) in which precipitation occurs in the last two or three tubes, has been observed in two only out of the 189 cases. This reaction is usually ascribed to the protective effect of excess of albumin, but clearly this could not be the explanation in these cases, since the amount of albumin was normal.

The particular significance which the gold reaction assumes in disseminated sclerosis and its relation to other important changes in the cerebro-spinal fluid in this disease are discussed later in this paper.

It has been suggested by some observers that the gold reaction is due to the products of degeneration of nervous tissues, and is related to the result, rather than the cause, of the disease. Such a theory ignores the specificity which characterises the form of the gold-curve in various nervous diseases. These experiments showed that the gold reaction is characteristically positive in early cases before structural changes are present, also during so-called remissions, when presumably the morbid process is stationary so far as the nervous system is concerned. The gold reaction is, therefore, probably related to the cause rather than the effect of the disease, though the latter may be responsible, directly or indirectly, for a positive globulin reaction.

Although many theories have been advanced on the subject, the nature of the colloidal gold reaction in the cerebro-spinal fluid is at present unknown. The test is based on the work of Zsigmondy,[17] who showed that precipitation of colloidal gold by electrolytes could be prevented by various proteins, which exhibited varying degrees of protective action. It was applied to the cerebro-spinal fluid in 1912 by Lange,[18] whose object was to ascertain the exact nature of the substance precipitated by half saturation with ammonium sulphate. He found that certain pathological fluids, in which he had expected a protective effect, exhibited, on the contrary, precipitating properties. He introduced the test as a specific and delicate one for neurosyphilis, and concluded that the reaction was due to the presence of different proteins. Numerous other workers have thought that specific proteins were responsible for the different zonal reactions and, as Cruickshank[19] points out, obviously confuse Zsigmondy's work on protective colloids with the precipitating action of the spinal fluid. In 1917 Felton[20] stated that the reactions were dependent on the relative amounts of globulin and albumin, the globulin having a precipitating and the albumin a protective action, zonal reactions being due to the inter-relationship of the two substances. Cruickshank,[19] in 1920, also came to the conclusion that the reaction depends upon relative amounts of globulin and albumin, the globulin having a special activity associated with a positive electric charge. Mellanby and Anwyl Davies[21] concluded that the precipitating power of the cerebro-spinal fluid rests in euglobulin, and that pseudo-globulin has a protective effect on the gold.

In postulating such theories many writers appear to ignore the fact, which has been emphasised by Miller and Levy,[22] that the exact nature of the substance precipitated by half saturation with ammonium sulphate, and the precise relationship between the proteins of the cerebro-spinal fluid, normal and abnormal, are as yet undetermined.

A merely superficial knowledge of the gold test in nervous diseases would appear to render untenable the theory that the various zonal reactions depend upon different amounts of albumin and globulin. Thus a high percentage of cases of disseminated sclerosis show a positive gold-curve when no globulin can be demonstrated in the cerebro-spinal fluid, while conversely in 40 per cent. of cases of cerebral tumour, for example, there is marked excess of globulin and a negative gold-curve.

The mechanism of the colloidal gold reaction was investigated in experiments involving dialysis and electrolysis, using 380 fluids giving positive gold-curves from various types of cases. By this means electro-positive and electro-negative colloids were separated and a series of tests carried out with fluid obtained from the anode and cathode respectively.

These experiments proved that globulin so collected is quite inactive in producing a positive gold-curve. The precipitate obtained by half saturation with ammonium sulphate was separated by centrifuging, dissolved in saline, and the ammonium removed by dialysis. It was found that in fluids giving a positive Wassermann reaction the precipitate so obtained had the power resembling that of the original fluid, of giving a positive gold-curve. In fluids from other diseases, including encephalitis, disseminated sclerosis, and meningitis, in which the globulin reaction was positive, it was found that this is not necessarily the case, this power frequently being completely lost. These experiments led to the conclusion that, although in some fluids, in particular those giving a positive Wassermann reaction, the gold-precipitating substance might be attached, possibly physically, to the globulin, it has no connexion with the globulin beyond this. In most of the cases of disseminated sclerosis examined it was found that the substance precipitated by ammonium sulphate, if such were present in the fluid, could be completely removed without the gold-precipitating power of the fluid being altered. In another series of fluids giving negative gold-curves and positive globulin reactions, the precipitate obtained by half saturation with ammonium sulphate was completely inactive as regards precipitating power. Thus although it is possible that the agent responsible for the reaction may, in some cases, be associated with the substance which gives a positive globulin reaction, or may cause a specific alteration in the physical state of the globulin, yet there is no evidence in these experiments to indicate that the precipitating substance is of the nature of globulin or other protein.

These results led ultimately to the conclusion that the specificity of the gold-curve, in various diseases, can only be explained on the theory that the particular form of curve must be related to the causal factor of the disease in question. If this theory is correct, one might expect that a type of curve similar to that in the cerebro-spinal fluid might be obtained in the blood serum of the same patient, since presumably this same causal agent would be present in the blood as well as in the cerebro-spinal fluid. Observations recorded in previous work on serum in this respect appear to be of little value, for neither the time elapsing after withdrawal of the blood nor the relative quantities of the various proteins present were taken into account. In order to compare the gold-curve in the cerebro-spinal fluid with that of the serum it is necessary to dilute the amount of protein in the latter so that it becomes equal to that of the cerebro-spinal fluid. Otherwise there is another factor which will obscure the true interpretation of the experiment. As is well known, serum itself will cause precipitation of colloidal gold. The type of curve obtained by serum alone depends upon the interval elapsing between withdrawal of the blood and performing the test. Taking this factor into account, control experiments were done on normal human serum, diluted as above described. The results so obtained were compared with those in which serum, similarly treated, from patients whose cerebro-spinal fluid gave a positive gold reaction, was employed. In the latter group of cases it was found that when globulin is removed from both the cerebro-spinal fluid and serum, the filtrate gives a similar type of gold-curve. In both cases initial and maximal precipitation occurred in the same tubes, so that the type of curve produced was similar. Therefore, it was concluded that the factor responsible for the gold-curve is present in the blood as well as in the cerebro-spinal fluid, and that it is independent of the globulin in each.

Hence it seemed probable that the gold-curve in various diseases is related in some way to the causal factor, toxic or otherwise. This theory is supported by the observation that the gold reaction may be positive in the cerebro-spinal fluid in cases of syphilis even when the nervous system is not involved, and in cases of pernicious anæmia before symptoms of subacute combined degeneration are present.

It has already been pointed out, in discussing the pathological aspect of the problem, that the histological evidence is in favour of a toxic origin of the disease. These experiments on the colloidal gold reaction appeared to support this view. The question arises as to the source of such a toxin and whether, if such exists, its action can be demonstrated in any other part of the body.

In an attempt to ascertain whether such a toxin existed, an investigation of the liver functions of patients suffering from disseminated sclerosis was carried out. In 64 out of 86 cases examined, the glycuronic acid test was completely negative after the administration of aspirin. Further, in these patients there was indicanuria, the average amount of indican being 10 to 12 times the normal amount.

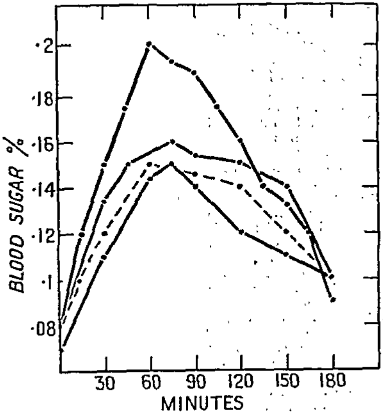

Chart showing type of blood-sugar curve obtained during lævulose-tolerance tests in patients with disseminated sclerosis.

Finally, lævulose-tolerance tests were carried out. It was found that 60 of these patients gave abnormal curves. H. MacLean's method was employed for the blood-sugar estimations which were done every 15 minutes in some cases and every 30 minutes in others, for three hours. Reference to the accompanying chart will show the type of curve obtained. It will be seen that the difference between the fasting and highest values in these curves exceeds 0·05 per cent., that the highest point of the curve is not obtained for 60 to 90 minutes, and that there is a delay in return to the original level. The results of these glycuronic acid, indican, and lævulose-tolerance tests led to the conclusion that in a high percentage of cases of disseminated sclerosis there is deficiency in the antitoxic and metabolic functions of the liver.

The question arises whether the ætiological factor is responsible for such loss of detoxicating power, or whether, owing to this deficient detoxicating mechanism, this factor is able to gain access to the body. In either case, it seemed probable from these experiments that there is a toxic factor to be taken into account in disseminated sclerosis, whether this be primary or secondary to some ætiological agent.

In discussing the possibility of the existence of autogenous or exogenous toxins, it was emphasised that none of these factors could be more than predisposing causes in the production of the well-defined clinical and anatomical picture characterising disseminated sclerosis, and that there must be some specific determining causal factor. Correlating cultures. They are killed by a 0·5 per cent. solution of carbolic acid, and are inhibited by 5 per cent. solution of glycerol.

The cultures are excessively sensitive to changes in reaction. This sensitivity is one of the difficulties of cultural experiments. The pH of the medium must be not greater than 7·6 or less than 7·5 when cultures are initiated.

It has already been emphasised that no growth visible to the eye is ever present in solid or liquid cultures. Slight opalescence is frequently seen in liquid cultures. This is probably due to changes occurring as the result of growth.

The early experiments already described in this paper demonstrated that a change of reaction occurs when cerebro-spinal fluid from cases of disseminated sclerosis is cultured under certain conditions. This experimental observation was now more fully investigated. It was found that in an actively growing culture the production of acidity is progressive until about the fifth day, and then an alkaline reversion begins. Reference to the Table, illustrating a few of the experiments carried out in this connexion, will show the type of results obtained. Although a pH of 7·6 is essential for the initiation of a culture, yet when a certain stage of the culture is attained growth can be maintained, even though the pH has fallen to 7·0. All the pH determinations in this work have been carried out by the electrical method, using a hydrogen electrode. The cause of the production of acidity, and subsequently alkalinity, has not been fully ascertained. That it is a direct result of the growth of the virus is proved by the fact that it occurs only in actively growing cultures, but the exact mechanism of the change remains a problem for future investigation. The results of these experiments, however, were regarded as additional proof that the appearance seen in cultures can only be due to a living virus.

Important confirmatory evidence of this conclusion was obtained by experiments in which sugars were added to cultures in various stages of their development. There are particular difficulties in carrying out sugar reactions in this work. The first, and most obvious, is that the usual sugar reaction medium (peptone water) cannot be used, since the virus will only grow in a mixture of Hartley's broth and serum. It was ascertained that the latter were sugar-free, and careful comparison with controls was, of course, necessary. The interpretation of the tests with glucose depends essentially on such controls, for there is the additional factor of a glycolytic ferment in the serum to be taken into account. The possibility of the influence of such a ferment in cerebro-spinal fluid can be avoided by subculturing and using subcultures for the experiments. This method, however, does not overcome the difficulty in the case of serum, since it is necessary when making a subculture to add human serum. The glycolytic ferment might be destroyed by heat were it not for the fact that serum so inactivated is unsatisfactory for cultures. Hence the only way in which the test can be carried out in the case of glucose is by comparing the results with carefully made controls. In such control tubes slight breakdown of the sugar, with consequent slight increase in acidity, occurs. The extent of this change is not comparable with that occurring in the cultural experiments.

The sugar solutions used were sterilised by filtration through Berkefeld filters to avoid sterilisation by heat. The sugar was added to the culture so that it was present in a concentration of 1 per cent. The indicators used in this work were bromcresol purple (pH 5·2 to 6·8), bromthymol blue (pH 6·0 to 7·6), and phenol red (pH 6·8 to 8·4), but for accurate determination of the changes, the electrical method for determination of hydrogen-ion concentration was employed.

In no case was any gas formation observed, but in the cases of glucose, fructose, and mannitol there was production of acidity. The reaction of cultures to which glucose has been added begins to change in 12 to 24 hours. In the cases of mannitol and fructose no change of reaction is apparent until 36 to 48 hours, or even longer, have elapsed. A pH of about 6·5 is ultimately reached, seven to ten days after the initiation of the experiment. The reaction then remains stationary and there is no return to a more alkaline reaction, as occurs with living cultures. The Table illustrates these points.

If at the end of the fifth day, when reaction is about 6·9, cultures are examined microscopically, they will be found to be negative, and no growth can be obtained in subcultures. Therefore, although the virus itself may be responsible for the initial changes in the process it cannot produce the ultimate result, and further change of reaction must be due to some other factor.

Detection of the products of fermentation remains a problem for future research. It is obviously complicated by the fact that the virus itself induces changes in the medium, as evidenced by the changes of reaction in cultures, already described.

It may be mentioned in this preliminary communication that in no case could the original glucose, fructose, or mannitol be recovered from the cultures in which this production of acidity occurred.

Filtration.

It has already been indicated that various stages of development can be observed in slip cultures examined at varying intervals of time. An attempt was now made to determine whether the appearances observed were stages in the life-cycle of a virus. For this purpose filtration experiments were carried out. In view of the inadequacy of ordinary filtration methods, ultra-filtration has been resorted to. Until recently no method of standardising filters in quantitative terms had been evolved, so that the definition of what is meant by a filter-passer is uncertain. It has been pointed out by numerous workers that filtration through filters of the Berkefeld or Chamberland type is unreliable. A filter is not a mere mechanical sieve, and several factors other than the size of the filter-pore determine whether a given body will pass through it, and influence the results of filtration experiments. In this research collodion membranes have been used with a known size of pore, this being determined by the concentration of collodion used in the production of the membrane. These collodion membranes were kindly supplied by Mr. Elford, working at the National Institute for Medical Research. The method of preparation of membranes and the technique employed are described in a paper by Elford.[25] These ultra-filtration experiments are as yet incomplete, and will form an important part of future investigations. It may be mentioned in this preliminary communication, however, that when a certain grade of membrane was used, it was found that the filtrate contained granules only. The filtrate so obtained was inoculated into serum-broth, incubated at 37° C., and from this culture 24 hours later slip-cultures were made in the usual way. In such slip-cultures the characteristic appearance of spheres and granules was obtained 24 to 36 hours later. The inference drawn from these preliminary experiments is that spheres can be produced from the granules in cultures.

The correlation of these various experimental results led to the conclusion that, under certain conditions, a living virus can be cultured from the cerebro-spinal fluid from cases of disseminated sclerosis. The cerebro-spinal fluids of 188 cases of this disease have been cultured and examined in this way. In 176 of these cultures the characteristic appearance described was observed. These cases included patients undergoing a so-called spontaneous remission occurring in the course of the disease, as well as those stationary or clinically advancing. Hence this appearance was specific in that it could be demonstrated in such cultures, but was invariably absent in controls.

Many samples of uncultured cerebro-spinal fluid from these patients have been examined according to the microscopical technique described, but in no case have any spheres or particles ever been observed. This may be because the virus is not present in sufficient quantity, or exists in some form which cannot be seen by such a method. It may be due to lack of optical contrast between the virus and its surroundings, that is, to insufficient difference of refractive index between the virus and the medium in which it is immersed. Cultures of the blood serum of such patients have been uniformly negative, and if at any stage of the disease the blood be infective, such a stage has not been detected in this work.

Cultures of cerebro-spinal fluid from 209 control cases have been examined by this method and proved to be completely negative in this respect. These control cases include normal cases, hysteria, tabes dorsalis, cerebro-spinal syphilis, subacute combined degeneration of the cord, transverse myelitis, spinal compression, epilepsy, cerebral tumour, and encephalitis.

As regards the method of cultivation, it has been emphasised that reliable results can only be obtained by the use of normal human serum. Serum from patients suffering with disseminated sclerosis cannot be used *for this purpose. Such serum cannot be* described as being inhibitory to the growth of the cultures, but simply acts like any other unsuitable serum, such as that of goats, rabbits, monkeys, and guinea-pigs. Horse serum can be used as a substitute, but it is unsatisfactory. The cultures take much longer to develop, and the only reliable way in which characteristic cultures can be obtained is to use normal human serum.

In the preparation of cultures, it is preferable to receive the cerebro-spinal fluid directly into the culture medium. If this is not done, the time elapsing between withdrawal and culturing of the fluid must be very short, otherwise growth cannot be obtained in cultures. In this connexion it may be mentioned that transference of the material, either before culturing or before microscopical examination of the cultures, is very undesirable. Such a procedure leads to unreliable and inconstant results, although the reason for this is not, at the moment, perfectly clear.

The cerebro-spinal fluid must be withdrawn under strictly aseptic conditions. Unless particular care is exercised in this respect bacterial contaminations, which so easily occur, not only obscure the microscopical appearance but prevent growth of the virus and so render the culture useless.

It was recognised that if the virus described is the causative agent of disseminated sclerosis it might presumably produce a specific effect on myelin. Such an action might be due to the virus itself or the result of some product of the virus. The investigation of this possibility has been carried out by Dr. Hocking, and is described by him in a paper which follows.

It has already been pointed out that there is evidence of a toxic factor in disseminated sclerosis. In discussing the significance of the results which led to this conclusion, it was emphasised that if a toxin exists as an ætiological factor, it must be elaborated from a highly specific source, in view of the clearly defined clinical and anatomical features characterising disseminated sclerosis. The question arises what is the relationship of the virus to this toxic factor. Evidence that such a relationship exists is afforded by a study of the cultural properties of the cerebro-spinal fluid and its capacity to produce a positive gold reaction. Thus it has been found that in all cases of disseminated sclerosis, in which colloidal gold test was positive, the virus could be cultured from a sample of cerebro-spinal fluid taken simultaneously. It has been found that if on a subsequent occasion a sample of cerebro-spinal fluid from the same patient yielded negative cultures the gold-curve had also become negative. This observation was confirmed so often that it must be concluded that there is some relationship between the factor responsible for the precipitation of colloidal gold and the presence of the virus in cultures of cerebro-spinal fluid. It is evident that this factor cannot possibly be related directly to the presence of the virus. Cerebro-spinal fluid will, of course, precipitate colloidal gold many hours after withdrawal when it can no longer be used to obtain cultures of the virus. Neither is the converse relationship necessarily true, for the gold test may be negative in cerebro-spinal fluid from which positive cultures can be obtained. Hence, although a correlation of the colloidal gold reaction and cultural results shows a definite connexion in this respect, the precise relationship has not been determined. It is conceivable that the factor responsible for precipitation of the gold results from some product, toxin or otherwise, of the virus. This possibility will be investigated in future research.

An attempt has been made in this preliminary communication to show how the problem of the ætiology of disseminated sclerosis was investigated in the light of the evidence provided by the histological observations of previous workers, and that afforded by the results of the colloidal gold and liver function tests carried out in this research. A simple experiment, designed to discover whether or not anything of the nature of a living organism was present in cultures of cerebro-spinal fluid, gave important results which suggested that such might be the case. The correlation of these experiments led to a fuller investigation of the subject, and to the use of a method which previously had not been employed for the examination of material from cases of disseminated sclerosis. A characteristic appearance, specific in that it can be obtained only in cultures of cerebro-spinal fluid of cases of disseminated sclerosis, is seen by employing a certain technique.

The following experimental observations support the theory that this appearance is due to a living virus.

1. Multiplication in vitro occurs.
2. Subculturing can be effected.
3. Sensitivity to hydrogen-ion concentration, temperature, and certain chemical agents is manifest.
4. Sugar reactions, at least in their initial phases, are induced by actively growing cultures, although subsequently they may be due to some other factor.
5. Changes in the hydrogen-ion concentration of the medium results from, and is associated with, growth of culture.

It will be evident that the appearance of the cultures described bears a striking resemblance to the organism which is regarded as the causative agent of bovine pleuro-pneumonia. The latter is of particular interest because it appears to be a connecting link between ordinary bacteria and those known as filtrable viruses. Pleuro-pneumonia is the smallest organism known to grow under ordinary bacteriological methods of cultivation. It is a small particulate body of about 0·2μ diameter. The particulate form is accompanied by and is dependent for its reproduction on a larger spheroidal body which develops from the particulate form.[24] The results embodied in this paper have led to the conclusion that a similar sequence of events is to be observed in cultures of cerebro-spinal fluid from cases of disseminated sclerosis. In both cases varying phases occur, the small granular form being associated with other bodies of essentially different characters.

Except for the virus of pleuro-pneumonia, cultivation of filtrable viruses has not yet proved possible in the absence of living cells. It is clear that until cultures can be made in an artificial medium and separated from cellular material, progress in their study is hindered by the presence of many uncontrollable and undetermined factors. In this research, however, such conditions have been more nearly attained, since it is necessary to add human serum only to the medium.

It has been suggested by many authorities that filtrable viruses are not of the nature of living organisms, and that enzymes or ferments may produce the observed results. Power of multiplication alone is not necessarily proof of life, neither is sensitivity to hydrogen-ion concentration or temperature. No organism belonging strictly to the group of filtrable viruses has yet been observed with sufficient accuracy to enable a description to be given of its cultural and morphological characteristics. It would appear, however, that a study of the virus described in this paper survive. Hence the importance of recognising and treating the disease in its earliest stages, when the neurones are merely poisoned but not yet degenerated. Fortunately, combined clinical, serological, and bacteriological examinations now enable us to diagnose such cases at an earlier stage than was formerly possible.

Summary.

1. A filtrable virus (*Spherula insularis*) has been observed and cultured by Miss K. Chevassut from the cerebro-spinal fluid in 176 out of 189 cases of disseminated sclerosis.

2. In a control series of 269 cases of other nervous maladies, organic and otherwise, no such organism was observed.

3. Cultures of this virus have been inoculated in a small series of seven monkeys. One of these monkeys developed paralytic symptoms and examination of its spinal cord by the Marchi method shows tract degenerations in one posterior column and one direct cerebellar tract. A second monkey shows degenerations in one antero-median and in both lateral columns.

4. Experimental treatment by an autogenous vaccine has been carried out in a series of 128 cases of disseminated sclerosis; 70 of these patients have been under observation long enough to yield suggestive results. Four illustrative examples are quoted.

5. In a few cases the patient's blood-serum, after vaccine treatment, developed an inhibitory action upon the growth of the spherula *in vitro*.

6. The clinical results, so far, may be summarised as follows:—

Out of 10 early cases, 9 improved and 1 remained in statu quo.
„ 27 moderate cases, 22 improved and 5 not improved.
„ 33 advanced cases, 9 improved and 24 not improved.

7. The serological observations, so far, yield the following results:—

Out of 10 early cases, 4 developed negative cultures; 8 showed improvement in the gold and globulin reactions.
Out of 27 moderate cases, 4 developed negative cultures; 21 showed improvement in the gold and globulin reactions.
Out of 33 advanced cases, in no case did the cultures become negative, whilst in 20 there was improvement in the gold and globulin reactions.

8. In assessing the value of any treatment special caution must be exercised, in view of the well-known tendency of disseminated sclerosis to undergo spontaneous remissions.

9. Degenerations within the central nervous system are a permanent affair and regeneration does not occur. The most that can be hoped for, in any form of treatment, is to arrest the malady at the stage which it has already reached and to make the most of those nervous structures which survive. Restoration of degenerated nervous tissues to normal is not to be expected.

I beg to tender my grateful thanks to many of my colleagues at Westminster Hospital for their continuous kindly encouragement, and for their courtesy in sending me patients for experimental treatment. Especially am I indebted to Dr. D. H. de Souza, Dr. A. S. Woodwark, Dr. A. W. Stott, Dr. Adolphe Abrahams, and Dr. W. E. Lloyd.

References.

1. Dawson, J. W.: Trans. Roy. Soc. Ed., 1916, l., 517.
2. Bullock, W. E. (now Gye): THE LANCET, 1913, ii., 1185.
3. Gye, W. E.: Brain, 1921, xliv., 213.
4. Kuhn, P., and Steiner, G.: Med. Klin., 1917, xii., 1007.
5. Marinesco, G.: Rév. neurol., 1919, xxxv., 481.
6. Rothfeld, J., Freund, J., and Hornowski, J.: Deut. Zeit. für Nervenheilk., 1921, lxvii., 257.
7. Birley, J. L., and Dudgeon, L. R.: Brain, 1921, xliv., 150.
8. Noguchi, H.: Jour. Amer. Med. Assoc., 1923, lxxxi., 2110.
9. Schultz, E. W.: Jour. Immunol., 1928, xv., 229.
10. Levaditi, C., and Nicolau, S.: Compt. rendus Soc. biol., 1922, lxxxvi., 228; ibid., 1923, lxxxviii., 66.
11. Andrewes, C. H.: Proc. Roy. Soc., B., 1929, civ., 537.

A CASE OF
CALCIFICATION OF THE PERICARDIUM.

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(WITH ILLUSTRATIONS ON SPECIAL PLATE.)

A CASE of calcification of the pericardium was discovered in the course of an opaque meal examination of the stomach. The condition is rare, as shown by the published cases to which I shall refer.

The patient, a woman aged 67, was admitted to the London Hospital under Mr. Hugh Lett, and gave a history of attacks of pain in the upper abdomen, nausea, and vomiting every week or two for 12 months. The attacks were said to last from two days to one week, and they had no relation to exertion. Pain was felt in the right scapular region and down the right side, but was never severe. Freedom from attacks might last seven weeks. There was an indefinite history of indigestion since the menopause. In her previous history mention was made of several attacks of influenza and bronchitis. She had never had rheumatism, chorea, pleurisy, or pneumonia. Up to five months before admission she could walk a couple of miles and enjoy the exercise; she had never been short-winded. Because of her gastric history, she was referred to the radiological department for a barium meal examination to confirm a diagnosis of gastric ulcer.

Radiological Examination.

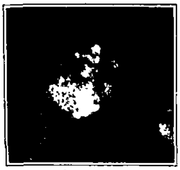
Before the ingestion of barium the heart appeared strikingly denser than normal. The greatest density was at the right auricular border and along the diaphragmatic border. Where the two joined a sharp angle was formed. Absence of the normal smooth contour of the right auricle was obvious. No pulsation was visible and the aorta was normal. Less evident, but definite, were patches of calcium scattered over the cardiac shadow, but almost absent over the apex. The apical portion of the heart—and this only—was seen to pulsate strongly and freely and to stand out in contrast with the rest of the denser calcium-covered pericardium where no pulsation was visible. The appearance suggested that the strong muscular apical contraction might have interfered with the formation of calcium deposits in that region. The heart as a whole scarcely moved with respiration. On the screen the cardiac apex looked like a living shadow, protruding out of an immovable casing with every pulsation. Some movement of the diaphragm was seen. The lung fields were clear. Slight scoliosis was also present.

Barium fluid given for the examination of the stomach showed no gross deviation of the œsophagus nor any delay, and no obvious radiological evidence of mediastinitis. The gastric examination revealed a definite ulcer near the pylorus, and the general appearance of the pars pylorica suggested carcinomatous changes. The radioscopic gastric findings were confirmed at operation. The pericardial calcification did not cause any untoward result from the anæsthetic or operation, and the patient left the surgical ward in about a fortnight. It seems therefore that in this case, as in some others, the pericardial condition was consistent with fair general health, and the heart worked successfully, even under the strain of anæsthesia and serious abdominal operation. The condition had been totally unsuspected clinically, had given rise to no clinical symptoms or signs, and had apparently not made any difference to the patient's life. It had no connexion with her gastric illness.

Films of the chest (see Plate, Figs. I.–III.) show *the obvious calcification of the pericardium*, denser in the region where a thick purulent fluid would settle by gravity, and curiously absent or less evident in the region of greatest cardiac impulse, the apex of the left ventricle. There was complete absence of pulsation at the right auricular border, and this suggested fixation (adherent pericardium).

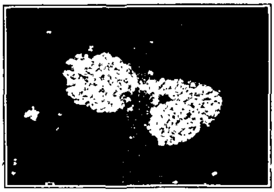
MISS K. CHEVASSUT: DISSEMINATED SCLEROSIS.

FIG. I.



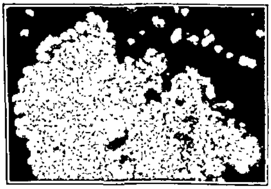
Photomicrograph of a colony, from a culture of cerebro-spinal fluid from a case of disseminated sclerosis.

FIG. II.



Two groups of spheres and granules, from a culture of cerebro-spinal fluid from a case of disseminated sclerosis.

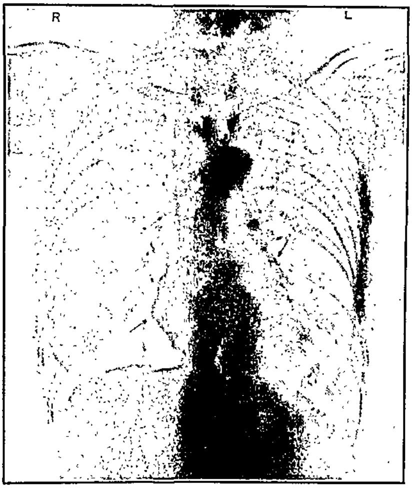
FIG. III.



Large degenerating colony, from a culture of cerebro-spinal fluid from a case of disseminated sclerosis.

DR. VILVANDRÉ.

FIG. I.



Anteroposterior teleradiogram taken at 2 metres' distance with patient standing.

FIG. II.

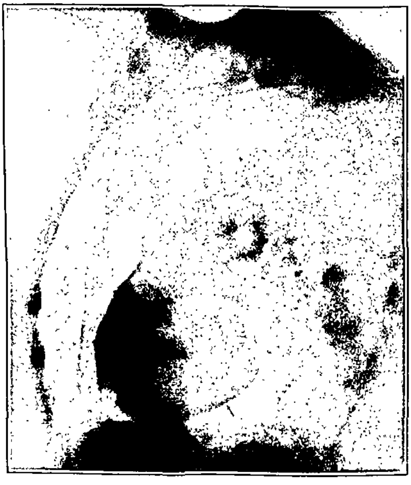
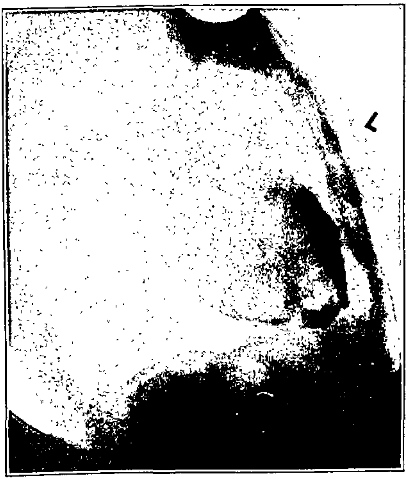


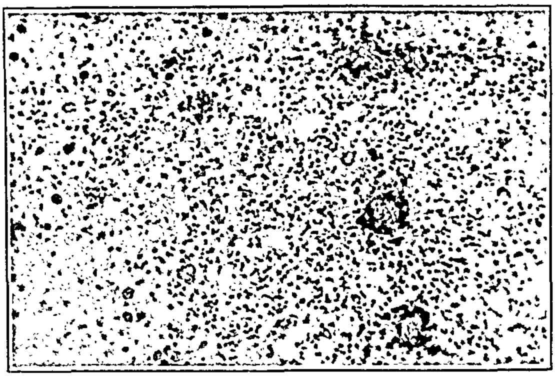
FIG. III.



Radiograms of chest, taken in right semi-lateral position and in left lateral position.

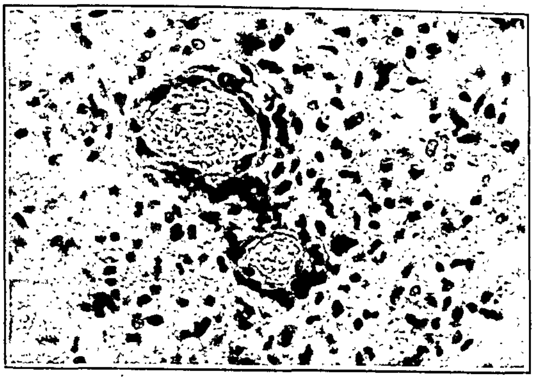
DR. VILVANDRÉ: CALCIFICATION OF THE PERICARDIUM.

FIG. I.



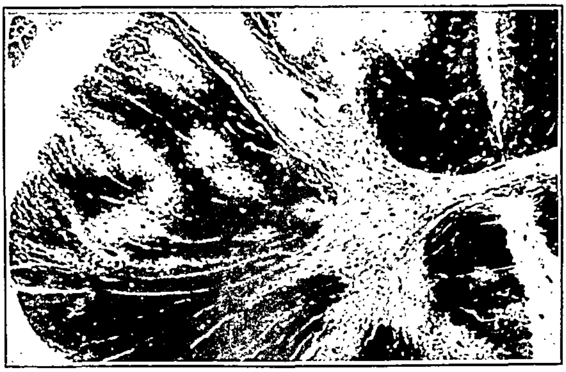
Low-power photograph of the spinal cord, showing the extra-adventitial infiltration around a group of vessels. Note the numerous large spaces in the tissues.

FIG. II.



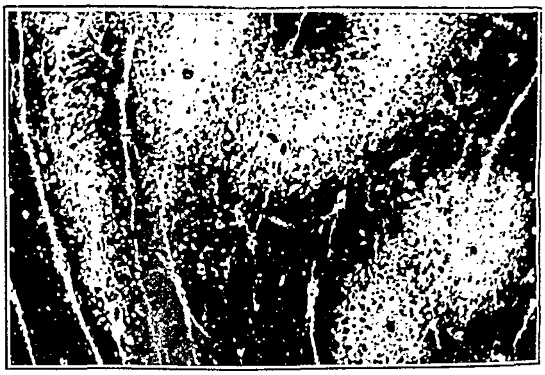
High-power view of the extra-adventitial infiltrate to show the character of the cells present. Perivascular infiltration, chiefly with fat granule cells, is also seen.

FIG. III.



General view of the spinal cord stained by the Weigert-Pal method to show the wide zones of demyelination around the vessels.

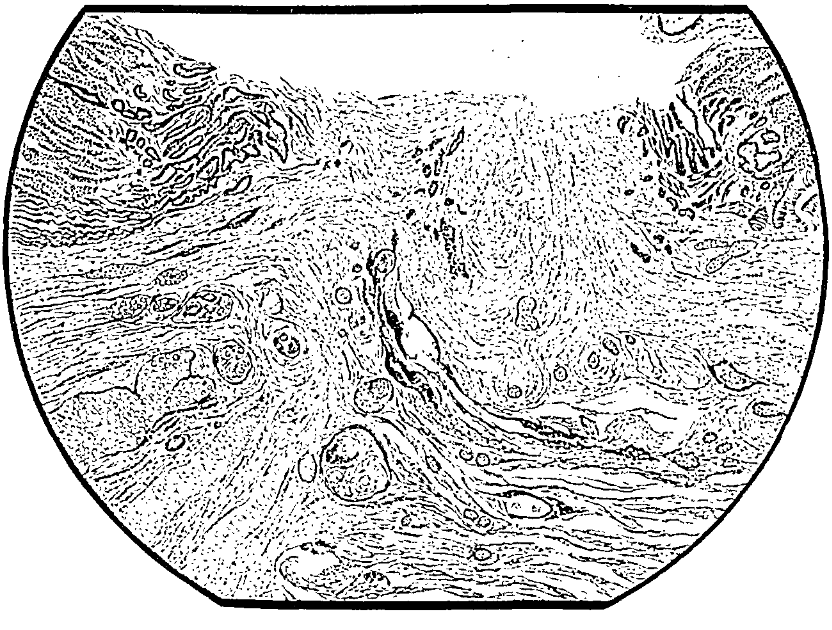
FIG. IV.



Weigert-Pal preparation of the spinal cord showing complete demyelination in the areas immediately around the vessels and partial demyelination in the zones peripheral to these.

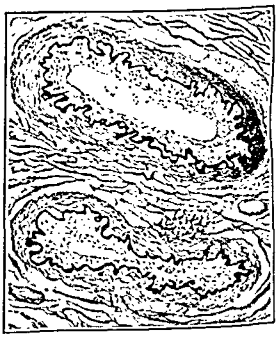
DRS. TROUP AND HURST: ENCEPHALOMYELITIS FOLLOWING SMALL-POX.

FIG. II.



A section through the ulcer × 10. At the margin the tumour can be seen invading the muscle coat. The ulcer is denuded of mucous membrane and is composed of fibrous tissue. A few tumour acini can be seen invading it from below.

FIG. III.



Arteries in the base of the ulcer showing endarteritis × 50.

PROF. KETTLE: MALIGNANT DUODENAL ULCER.

Clinical Examination.

Dr. John Parkinson kindly saw the patient with me a month later. Though rather wasted, she was cheerful and of good colour. The pulse was normal and the superficial arteries were not thickened. The veins of the neck were a little full, but showed no undue pulsation and no collapse. The apex-beat was of natural force and normally placed. The heart sounds were normal at all areas and no murmurs were heard. The electrocardiogram (Fig. IV.) showed a normal rhythm; in lead II. the auricular wave P is rather large, and T is flat, otherwise the curve appears to be normal. There were no symptoms of cardiac distress, and no signs of heart failure. Without the radiological discovery there seemed no reason, from the history or examination, to suspect any cardiac lesion.

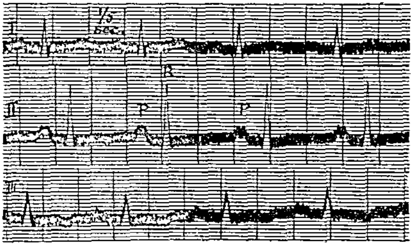
Previous Literature.

Case,[1] up to 1923, had found only 13 instances of a diagnosis of pericarditis calculosa (concretio pericardii) made during life. In July, 1924, Cutler and Sosman[2] added three, two of which were confirmed post mortem. In these two calcification of the endocardium and myocardium was also found at necropsy. They suggest that if calcification could be demonstrated in cases of suspected adherent pericardium there would be greatly increased evidence in favour of that diagnosis. They quote Wells who, in 1000 necropsies, found calcification in 4 out of 128 cases of adherent pericardium. Calcification of the heart itself is well known to pathologists. Scholz,[3] in 1924, described a case of myocardial calcification accidentally found post mortem. He mentions that Morgagni in 1762 published a case of calcification of the heart. Bordenare, in 1768, described a case of adhesive pericarditis and myocardial calcification found at necropsy. Samuel Foart Simmons and Henry Watson, in 1783, published a case of myocardial calcification with an illustration. In their case the patient had died of carcinoma of the œsophagus which, when he was admitted to the Westminster Dispensary, dominated the clinical picture. Watson attempted to explain the calcification, but to him atheroma and myocardial calcification were apparently one. Roth, in 1884, published an autopsy showing calcification of the heart walls, the kidneys, and the interstitial tissue of the gastric mucosa (see Scholz). In 1906 Leyden and Dairdsohn published a report of another necropsy in which there was evidence that calcification of the heart may be part of a calcium metastasis, and that in such cases lungs, kidneys, and stomach form the places of predilection for the deposition of calcium, on account of their abundance of oxygen and acids. In 1907 Hedinger (quoted by Scholz) said that heart calcification was explained by some on the basis of myocardial degeneration, necrotic foci being found by the side of calcified areas, and in the same year Weichert, reporting a similar case (myocardial calcification), looked upon the condition as secondary to myocardial degeneration of bacterial origin.

Mueller (Turner[4]) does not believe that the calcium deposit is due to an increase of the proportion of calcium in the blood, but that a most minute amount is present in each living cell. When the cell dies the calcium is liberated as a carbonate or phosphate and is then precipitated. The causes of pericardial calcification are given as rheumatic or inflammatory chest conditions, pericarditis, or pleurisy. Aneurysm was associated with it in one case, and rupture of the femoral artery in another, and in two separate instances rupture of the coronary and rupture of the right auricle (Turner).

Osler and McCrae[5] say that this remarkable condition may follow pericarditis, especially the suppurative and tuberculous forms, and that A. E. Jones's careful study shows that the condition is usually latent and unrecognised. Allbutt and Rolleston[6] mention that an adherent pericardium may undergo calcification; that "there seems to be good reason to believe that a purulent collection in the pericardium may in exceptional instances be absorbed, leaving dense and thick adhesions, or some of it may remain in an inspissated condition as a yellowish white paste, limited and encapsuled by adhesions consisting of caseous material in which calcareous particles may afterwards form." They describe it as a condition that may follow chronic pericarditis in extremely exceptional instances, and say that the pericardium may become a completely calcified shell, and may even encroach upon the cardiac walls, constituting the so-called "bony heart." They mention that it has been affirmed that a calcified pericardium may give rise to a peculiar percussion sound of an osteal quality. Turner describes pericardial calcification as a rare pathological finding. He found 89 authenticated cases in the literature; most of them were discovered at autopsy. Turner diagnosed one clinically and found two others post mortem. In his first case the apex-beat was not visible, no shock nor thrills were present, nor could the apex-beat be detected by palpation. The heart sounds were distant and feeble, but no murmurs were audible; the cardiac dullness extended three fingers to the right of the mid-sternal line and four to the left. The radial artery was sclerotic. The patient was sent to the X ray department. Ultimately the diagnosis of marked fibrosis of the right lung and calcification of the pericardium was made.

FIG. IV.



Electrocardiogram from case of calcification of the pericardium.

Absence of Symptoms.

The absence of symptoms is noteworthy and most authors point it out. Schlesinger[7] mentions that most of the cases of pericardial calcification are characterised by their symptomless development, their frequency in early adult life, and the freedom of the great vessels from involvement. Failure of the heart is late and probably due to other causes, and there is often ascites. An unusual symptom of the condition was found in a case, described by Wallace Jones and Roberts[8] in 1927, where the patient, a young man, had dyspnœa and marked cyanosis, the former being relieved by rest but the latter not improved by inhalation of oxygen. They gave an electrocardiogram of their case. The heart does not appear to become embarrassed, despite what would be expected and has been taught; it seems to go on performing its functions satisfactorily for many years, in some cases for 10 or 20 years.

A. E. Jones, quoted by Osler and McCrae, found that no cardiac symptoms were present in 38 of his 59 collected cases. In only one of the 59 was adherent pericardium diagnosed, and calcification was not suspected in any (Turner). Mitchell[9] remarks, "How is it that the heart, encased in a vice-like grip, functions with apparently so little disturbance?" It is indeed surprising. In my case the apex was functioning freely. Turner mentions that in Drummond's case the pathologist had to use bone forceps to cut the pericardium, but a few weeks previously the man had been a sailor working before the mast. In Douglas and Yates's case the patient was 25 when he died of pneumonia, and the condition discovered post mortem had been totally unsuspected (Turner). Although X rayed before death, the case reported by Langmead[10] in 1912 had not been recognised radiologically, the report stating that "the shape of the heart is most peculiar. There appears to be a protuberance from the left ventricle near the apex, pulsation of which appears to be more vigorous than that of the ventricle, and its walls are thinner. The appearance suggests aneurysm of the left ventricle." In 1917 Mueller[11] emphasised that his eight cases had in common the entire absence of clinical findings which might suggest calcification of the pericardium, but he mentions the success of Rieder, Groedel, and Schwartz, all of whom made a radioscopic diagnosis of the condition in a living subject. Turner says that in none of his patients was there any marked clinical symptoms pointing to a serious heart condition, but the X rays in one case enabled a diagnosis of calcified pericardium to be made, and this was confirmed post mortem. In the other two cases, where X rays were not employed, the diagnosis was not made before death.

Stone[12] mentions that adhesions between the visceral and parietal layers of the pericardium may produce little disturbance of heart function "even when more or less obliteration of the pericardial cavity has occurred, provided the heart's contractile efforts are unimpeded by extrapericardial adhesions to the chest wall and surrounding structure of the mediastinum." When this occurs there follow certain signs and symptoms which he enumerates, and among which is rotation of the heart towards the back, accompanied, according to his observations, by a friction-rub synchronous with the heart's action below the angle of the left scapula and possibly not heard over the anterior portion of the chest. He shows a radiograph of a case of pericarditis and mediastinitis. He further mentions that under the fluoroscopic screen diminished pulsating excursions of the cardiac shadows may occur, and that the deposition of lime salts in the connecting tissue after chronic inflammation is not an unusual pathological finding. Although it may occur in the endocardium or myocardium, the pericardium is usually more extensively involved. He adds that the clinical signs and symptoms may be inconclusive, and that the main evidence will be radiological. Under X rays fixation of the apex and the failure of the apex to descend upon inspiration may occur. Cutler and Sosman emphasise the importance of careful radioscopic and radiographic examination in all cases suspicious of adherent pericardium, especially because the clinical diagnosis is unlikely to be made with certainty and further because the operation of cardiolysis and excision of the pericardium is followed by favourable results. Stone puts forth a similar view.

The honour, or good fortune, of being the first to record a case of pericardial calcification rontgenologically appears to be in dispute. According to Stone, Schwartz, in 1910, was the first to show a case of calcified pericardium during life by radioscopy. Starck[13] also mentions this, and Groedel described one in 1912. Scholz[14] mentions a case of myocardial calcification demonstrated during life. He says that there are only two previous instances on record—viz., the cases of Groedel and Le Wald. In neither of these cases was an autopsy obtained, so that no final decision can be given on whether the findings described by the authors were due to calcification in the myocardium or pericardium. He therefore claims that his case is the first authentic one. Cases of pericardial calcification were described by Rieder, Weil, Müller, Heimberger, Youmans and Merrill, Klason Zelibe, and others. The discovery of the cases was sometimes a chance and sometimes induced by the presence of slight heart failure, or of Pick's pericarditis of the pseudo-liver-cirrhosis type.

The principal point in the differential diagnosis between pericardial and myocardial calcification is that the flakes of calcium will be seen tangentially in the pericardial condition, and for that purpose antero-posterior and lateral views should be taken. Scholz recommends the use of intensifying screens, and rapid yet sufficient exposures to show the plaques. The Potter Bucky diaphragm can be used to increase the contrast of shadows, but the sharpness of outline of the beating heart is sacrificed.

In the case described I used a teleradioscope, taking the films at a distance of 2½ metres. Unless the radiologist is aware of the condition it can be missed in a hasty screening, especially as the usual soft radiations employed for the detection of pulmonary lesions only show the outline of the heart and cast no obvious contrasting shadows of the heart substance itself.

My thanks are due to Mr. Hugh Lett, to whose courtesy I am indebted for permission to publish this case, and to Dr. John Parkinson, who saw the case with me later and took the cardiogram.

References.

1. Case, J. T.: Jour. Amer. Med. Assoc., 1923, lxxx., 89, 236.
2. Cutler, E. C., and Sosman, M. S.: Amer. Jour. Roent. and Rad. Ther., 1924, xii., 312.
3. Scholz, Thomas: Arch. Int. Med., 1924, xxxiv., 32; Jour. Radiol., 1924, v., 131.
4. Turner, H. H.: Internat. Clin., 1924, iv., 137.
5. Osler, W., and McCrae, T.: Principles and Practice of Medicine, New York and London, 1923, p. 762.
6. Allbutt, C., and Rolleston, H. D.: System of Medicine. London, 1909, vi., 31, 76.
7. Schlesinger, H.: Med. Klin., 1926, xxii., 11.
8. Jones, H. W., and Roberts, R. E.: Brit. Jour. Radiol., 1927, i., 167.
9. Mitchell, J. H.: Trans. Chicago Path. Soc., 1909, viii., 109.
10. Langmead, F. S.: Med. Soc. Trans., London, 1912, xxxv., 232.
11. Mueller, E. F.: Fort. a. d. Gebiet. d. Roentg., 1917–18, p. 231.
12. Stone, W.: Amer. Heart Jour., 1926, i., 434.
13. Starck, H.: Med. Klin., 1928, xxiv., 1736.
14. Scholz, T.: Jour. Radiol., 1924, v., 131.

DISSEMINATED ENCEPHALOMYELITIS FOLLOWING SMALL-POX:

WITH REPORT OF A FATAL CASE.

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(WITH ILLUSTRATIONS ON SPECIAL PLATE.)

AS a result of the attention paid during recent years to the disseminated encephalomyelitis following vaccination, the peculiar character of the lesions, as well as the fairly distinctive clinical features of many of the cases, have become common knowledge. It is not, however, generally known that a similar complication may arise in the course of measles, small-pox, and other infective fevers, or even during antirabic treatment. The encephalomyelitis of measles has been very fully studied by Greenfield (1929) and others, and it is clear that the histological lesions in these cases are indistinguishable from those of the post-vaccinal disease. While, however, there are to be found in the literature a few cases of encephalomyelitis following small-pox in which the descriptions are sufficiently precise to allow of their probable identification with the disease under discussion, the accounts are for the most part very incomplete, and in any case date back to a time when the characteristic histological feature—namely, perivascular demyelination—was unrecognised. The following case, therefore, appears to merit description.

Clinical History.

The patient, an unvaccinated man aged 63, was admitted to the Willesden Small-pox Hospital on June 7th, 1929, the ninth day of illness and the fifth day of rash. He had attended a wedding party on May 19th at which an unrecognised case of small-pox (alastrim) was also a guest. Fifteen other people were infected either directly or indirectly from the same source but no complications arose amongst these associated cases. The rash was discrete, typical in distribution, and in the pustular stage. The temperature was normal and the pulse-rate 76. The eyes were inflamed and discharging. The general condition was good.

On June 10th he complained of slight pain in the right knee, but examination failed to reveal any abnormality, and he was able to get up for baths. On the 13th he asked for permission to get up, which was granted. During the night of the 13th–14th he slept well, but on the morning of the 14th he complained of severe pains in the abdomen and legs, the former appearing to be of the girdle type. The temperature rose to 101° F. and he had several rigors with profuse sweating. There was retention of urine, the bladder reaching to nearly the level of the umbilicus, and it was thereafter necessary to pass a catheter twice daily until his death.

On the next day complete flaccid paralysis of the lower extremities with involvement of the abdominal muscles had developed. The knee-jerks, the plantar and the abdominal reflexes were absent. Tactile, thermal, and pain sensations were very much impaired and later were lost. The pupils were contracted and reacted sluggishly to light and accommodation. The temperature rose to 104° F. and there was a recurrence of the rigors. The pulse was 122, regular, and of good volume. The heart sounds were feeble and there were signs of congestion at the bases of the lungs. The paralysis did not at this time affect the upper extremities, though later there was considerable diminution of muscular power in the arms, so that the patient could not feed himself. He was very drowsy and did not appear to understand what was said to him. On the following day he complained of severe headache and there was albumin in the urine. It was also noticed that the skin over the sacrum was affected; a large bed-sore subsequently developed, the tissues becoming gangrenous.

Incontinence of fæces developed on June 17th; before this the patient had been constipated. From this date until the patient's death there was gradual muscular wasting, more particularly in the lower extremities. The temperature ranged between normal and 102·6° F., falling in the morning and rising in the evening. The physical signs at the bases of the lungs became more pronounced and a troublesome cough developed. There was great difficulty in expectoration, due to paralysis of the intercostal muscles and to the viscid character of the sputum. The mental condition varied; occasionally the patient was in a comatose condition but capable of being roused; at other times he was alert and able to answer questions in an intelligent manner. On several occasions, particularly during the night, he had delirium of a low muttering type. On June 28th a painful swelling developed in the neighbourhood of the right parotid gland but subsided within five days. Evidence of cystitis was noticed on July 4th. Death took place on the ninth.

Specimens of the cerebro-spinal fluid and blood were taken on June 20th. The former was under slight pressure, but examination showed no abnormality. Wassermann tests with cerebro-spinal fluid and with blood proved negative.

Pathological Examination.

As permission for a full autopsy was not secured, only the brain and spinal cord were examined. The middle and lower lumbar and sacral cord was reduced to a very soft, greyish-pink mass and could not be removed except as a pulp; elsewhere the nervous tissue was of normal consistence and no other macroscopic abnormality was noted.

After pieces had been placed in formol bromide, to be cut later as frozen sections and stained by Penfield's modification of the Hortega method for microglia, the bulk of the brain and cord was fixed whole in 10 per cent. formol saline. Tissue was later embedded in celloidin and sections were stained with *hæmatoxylin and van Gieson and by the Nissl method.* Other blocks were mordanted and sections stained by the Weigert-Pal procedure. Finally frozen sections were used for the demonstration of fat and of neurofibrils by the Bielschowsky technique.

Description of Lesions.

Microscopically the lesions consist partly in perivascular infiltration and partly in changes (extra-adventitial) in the nervous tissues immediately surrounding the vessels; in all the affected parts of the nervous system this association of the pathological changes with the vascular apparatus is observed.

Perivascular infiltration—that is, the accumulation of cells in the Virchow-Robin spaces—is usually not very intense. In the case of many vessels, only a few cells, insufficient to produce a complete ring around the vessel, are present, while in others the cuff is more complete; perivascular sheaths several cells deep are, however, nowhere observed. Occurring as a rule in vessels surrounded by zones of demyelination, in a few regions this infiltration occurs in the absence of other changes. Lymphocytes, large and small, with occasional plasma cells, form a small percentage of the cells present, but the majority are granular corpuscles which, in sections stained for fat, are seen to be heavily laden with the lipoid products of myelin disintegration.

The extra-adventitial lesions are characterised by zones of demyelination, which in severely affected regions such as the spinal cord are very extensive and often coalesce with the similar areas around adjacent vessels. In Weigert-Pal preparations the inner two-thirds of these zones are usually wholly free from myelin sheaths, while the outer third, in which the majority have been destroyed, may show a few persisting but ballooned and distorted myelin tubes (see Plate, Fig. IV.). At the periphery of this zone, which with the lower powers of the microscope is quite sharply demarcated, the myelin sheaths are normal.

Corresponding to the destruction of the myelin sheaths, there is, immediately around the vessels, considerable cellular infiltration, which in sections stained by the ordinary tissue stains is the most prominent feature (Figs. I. and II.). Most of the cells are microglial, in various stages of development up to the fully formed granular corpuscle. While showing a certain polymorphism, their nuclei do not exhibit the excessive irregularities and grotesque forms seen in the acute cases of the similar condition following vaccination; this is no doubt due to the fact that the present case was of much longer duration and had progressed to a stage of partial reparation. Their bodies are filled with fatty globules. While, however, there is much fat in these cells and in the similar elements in the Virchow-Robin spaces, the total amount is often small when compared with the extent of the demyelination; the observation made in post-vaccinal encephalitis that the waste lipoid products are removed from the damaged area with unusual rapidity seems equally to apply to the present case.

The other type of cell present in the demyelinated areas is a definitely enlarged glial cell with a large pale nucleus and abundant cytoplasm prolonged into numerous short processes; no fibre formation can at this stage be demonstrated. Leucocytes, of any variety, are absent from most of these areas, though here and there in the grey matter of the spinal cord a few focal collections of lymphocytes occur.

The use of the Bielschowsky method shows that a few axis-cylinders persist in the zones of demyelination; their number is, however, far below the normal and, of those that remain, many are thickened and stain more intensely than usual or show numerous fusiform, globular, or irregular swellings in their course.

Throughout the nervous system the nerve-cells are remarkably well preserved, and even when involved in a densely infiltrated area present no definite changes in their Nissl substance or in the shape, coloration, and position of the nucleus.

Distribution of Lesions.

Spinal cord.—The brunt of the morbid process has fallen on the spinal cord, though not equally on all regions; the transition from a severely damaged to a slightly affected or even normal segment is often very abrupt. As already stated, much of the lumbar region was so soft that sections could not be prepared. In the segments immediately above this region the changes are very intense and at first sight not obviously perivascular; owing to the fusion of many zones of infiltration and demyelination, the lesions appear to be more or less diffuse over a wide expanse of grey and white matter. There is considerable rarefaction of the tissues and large spaces appear in the sections: present even in frozen sections, they are not due to shrinkage in the celloidin or paraffin, and they are not filled with fat (Fig. I.). Microglial and glial proliferation is very prominent. A few mononuclear cells are present in the anterior fissure.

In the dorsal cord the extent of the lesions varies greatly at different levels, but no segment examined has completely escaped; the mid-dorsal segments are perhaps least affected, while in the lower dorsal region almost every vessel in the white matter shows a wider or narrower zone of rarefaction and infiltration. Perivascular cuffing is more definite than in other parts of the nervous system. Both grey and white matter is involved, and though at some levels the antero-lateral regions have suffered most, at others the posterior columns are also the seat of marked changes. In the middle and lower cervical cord similar severe changes are seen; the upper cervical segments are free from lesions.

At no level is the narrow zone of demyelination, not infrequently met with in post-vaccinal encephalitis, observed in the marginal zones of the cord or along the lips of the anterior fissure.

Brain-stem.—Except at the lower end of one olive, where a single vessel is surrounded by a wide zone of infiltration, the medulla is quite free from the typical lesions; a few vessels do, however, show simple perivascular cuffing of mild degree. The disease reappears in moderate intensity in the pons, where the central substance is chiefly affected, but almost disappears again when the mid-brain is reached.

MALIGNANT CHANGE IN A CHRONIC DUODENAL ULCER.

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(WITH ILLUSTRATIONS ON SPECIAL PLATE.)

PEPTIC ulceration of the stomach and duodenum is a common disease which, fortunately, appears to be amenable to medical treatment, at least in the majority of cases. Even long-standing ulcers of considerable extent can be coped with satisfactorily without resort to operative measures. But a question which must have a serious bearing on treatment is the relation of peptic ulceration to malignant disease. For if it can be proved that the frequency of carcinoma is significantly greater in the ulcerated than in the non-ulcerated stomach, the wisdom of medical treatment becomes immediately open to question, and the arguments in favour of excision of the ulcer are correspondingly strengthened.

Malignant Change in Gastric Ulcers.

Opinions are still divided as to the number of gastric ulcers which become malignant. On the one hand there is the teaching of the Mayo Clinic[1] who find malignant change in 71 per cent. of gastric ulcers; on the other is the statement of J. Ewing,[2] whose figures are in the region of 2–3 per cent. A. F. Hurst and M. J. Stewart,[3] in a series of 180 chronic gastric ulcers, found malignant disease in 6·1 per cent., and have only once found evidence that a carcinoma started in the scar of a healed ulcer. These discrepancies are no doubt due to differences in the criteria both of malignancy and previous ulceration demanded by different observers.

Evidence of malignancy must be unequivocal and must not merely consist of the presence of misplaced epithelium in the margins of the ulcer; while the proof that an ulcer preceded a carcinoma depends partly on the clinical history of the patient and partly on the histological features of the growth. A history of dyspepsia of long standing is of obvious importance, but this is not always forthcoming even in authentic cases of ulceration. On the other hand, a searching cross-examination of many apparently healthy individuals may bring to light symptoms which may be interpreted as pointing to a gastric or duodenal ulcer. Clearly the value to be placed on the clinical history must depend largely on the experience and judgment of the physician.

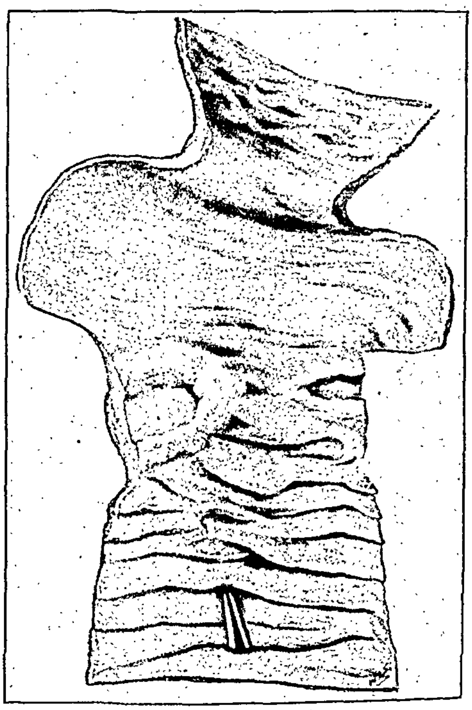
The histological diagnosis is possibly easier. In the chronic gastric ulcer the muscle coat in the floor of the ulcer is invariably destroyed and is replaced by dense inflammatory fibrous tissue, and a patchy though notable endarteritis is frequently found in the neighbouring vessels. In the primary cancer, on the other hand, the tumour cells infiltrate the muscle coat of the stomach which survives in the substance of the growth until that has become so large as to make the recognition of the primary lesion impossible. And endarteritis and other signs of inflammation are much rarer in the primary carcinoma than in the ulcer-cancer.

Irritation and Malignancy.

Whether the gradual destructive processes which produce the chronic peptic ulcer are comparable with those irritative conditions which are known to determine the occurrence of malignant disease in, for example, the skin, is open to doubt. In the cancer which can be produced experimentally by the application of tar to an epidermis, the malignant process is usually preceded by a simple, non-malignant proliferation of the epithelium; and the same is seen in the carcinomata of the skin familiar in certain industrial conditions. Excessive application of the irritant causes ulceration and is not followed by the production of carcinoma. In the peptic ulcer the *process is essentially a progressive digestion of tissue*; there may be slight hyperplasia of the epithelium at the margins of the ulcer, but this is rarely extensive, and there is nothing like the irritative hypertrophy which follows the application of true carcinogenetic substances, or even foreign bodies such as *Gongylonema neoplasticum.*

If peptic ulceration has any power at all to determine the development of carcinoma it is probably because of the separation and isolation, by the proliferating fibrous tissue at the margins of the ulcer, of small fragments of epithelium. This being so, it might be expected that peptic ulcer of the duodenum would also be the forerunner of malignant disease, for except in one particular, though possibly a very important one, the process in the duodenum is essentially the same as that in the stomach. The sole difference is the additional trauma to which the gastric ulcer is exposed from solid, imperfectly masticated food. But ulcer-cancer of the duodenum is excessively rare.

FIG. I.



Pylorus and duodenum opened from the front. *Glass rods in* the pancreatic and common bile-ducts appear at the ampulla of Vater (× ½).

In a series of autopsy records collected from various sources, J. B. Deaver[4] found 50 examples of carcinoma of the duodenum in 151,201 cases, and states that 30 of these arose in ulcers. It may well be that a more rigid examination of these 30 cases would demand the elimination of a number of them. The current teaching in this country is that ulcer-cancer of the duodenum is little more than a possibility. Hurst goes so far as to say that duodenal ulcers never become malignant, and though this is a statement which it is theoretically impossible to support, most people will agree that it expresses a good working rule.

Record of a Case.

The case here recorded is regarded as a true example of a duodenal ulcer-cancer; it illustrates well the difficulties which have to be met in arriving at the diagnosis.

The patient, a man aged 68 years, was admitted to St. Bartholomew's Hospital on Nov. 29th, 1929, complaining of vomiting. He was very ill and was inclined to wander, and the history of his illness was difficult to obtain. He is said to have suffered from vague pain in the upper abdomen with dyspepsia for three years. During the latter half of 1928 there was persistent and rather severe diarrhœa and in the beginning of 1929 flatulence and dyspepsia, starting two and a half hours after food and lasting for an hour, became more pronounced. The pain increased, and five months before admission to hospital vomiting became a prominent symptom, increasing till it was almost continuous. While in hospital he could retain nothing given by the mouth, and it was impossible to investigate him thoroughly. An X ray examination showed that the barium meal hesitated to pass into the second part of the duodenum, which never became properly filled; but no further tests could be made, and he died on Dec. 3rd, four days after admission, with the tentative diagnosis of carcinoma of the stomach. At the post-mortem examination on Dec. 4th the body was found to be extremely emaciated. There was a moderate degree of terminal hypostatic pneumonia, but no other morbid change was found, except in the stomach and duodenum.

The stomach was dilated and contained two and a half pints of fluid. Its wall was slightly hypertrophied, its mucous membrane was smooth, and showed no trace of old or recent ulceration. Similarly, the first part of the duodenum was dilated and hypertrophied, though its mucosa appeared natural.

Situated about 4·5 cm. from the pylorus and midway between it and the ampulla of Vater was an annular ulcer which surrounded the bowel, except for a small area behind (Fig. I.). The actual ulcer measured 3 by 1 cm., but its margin was thick and raised especially on the posterior and upper aspect, where a firm mass of growth extended for at least 1 cm. beneath the mucosa. The floor of the ulcer was smooth and clean, and it did not involve the head of the pancreas or the common bile-duct. Two small white glands were found in the gastro-hepatic omentum.

Microscopic examination shows an adenocarcinoma, involving the whole of the periphery of the ulcer and extending to the peritoneal coat. The two lymphatic glands contain secondary growth which shows a pronounced tendency to mucoid degeneration and has very little stroma.

Histological Evidence.

The condition, then, is undoubtedly malignant, and the histological evidence that the carcinoma started in a simple ulcer seems equally clear. The centre of the ulcer (see Plate, Fig. II.) is composed of dense fibrous tissue which extends to the peritoneal coat. The muscle coats have been entirely destroyed, though they appear abruptly again beneath the mucosa at the margins. The fibrous tissue is fairly well vascularised and some of the smaller arteries show well-developed endarteritis (Fig. III.). At the periphery the submucosa and muscle coats are invaded by the carcinoma, but the ulcer itself is free except for a few acini which are spreading from the margin into the centre towards the surface. A large portion of the ulcerated area, therefore, contains no growth; and unless we are to believe that the primary lesion was an intensely scirrhous carcinoma in which the growth of the stroma enormously outstripped that of the malignant cells, an hypothesis entirely at variance with the histology of the rest of the tumour and its metastases, we are forced to the conclusion that a peptic ulcer existed before the development of the carcinoma.

It must be admitted that the position of the lesion is against this view, since the great majority of peptic ulcers are situated considerably nearer the pylorus; and the clinical evidence of long-standing ulceration is not conclusive. The histological evidence, however, seems strong enough to outweigh these objections, and viewing the case as a whole it seems justifiable to accept it as an example of ulcer-cancer.

In view of the frequency of ulceration of the duodenum it is remarkable that so few undoubted cases of ulcer-cancer have been recorded. Their scarcity strongly supports the view of those who hold that there is nothing inherent in the peptic ulcer which predisposes to malignancy, but that cancer develops in an unhealthy rather than an ulcerated epithelium.

I am indebted to Dr. H. Morley Fletcher, under whose care the patient was while in hospital, for permission to publish the records of the case.

References.

1. Wilson, L. B., and MacCarty, W. C.: Amer. Jour. Med. Sci., 1909, 138–846.
2. Ewing, J.: Neoplastic Diseases, 3rd ed., p. 674.
3. Hurst, A. F., and Stewart, M. J.: Gastric and Duodenal Ulcer, 1929.
4. Deaver, J. B., and Ravdin, I. S.: Amer. Jour. Med. Sci., 1920, clix., 469.
5. Loc. cit., p. 26.

Medical Societies.

MEDICAL SOCIETY OF LONDON.

AT a meeting of this Society on March 10th, with Mr. DONALD ARMOUR, the President, in the chair, a discussion took place on

CARDIAC INFARCTION.

Dr. J. W. MCNEE, in opening, said this subject was of the greatest clinical interest, both to the general practitioner and the physician or surgeon. He would himself deal with it as a general physician. Until 1924 he knew nothing about cardiac infarction as a part of clinical medicine, though he had seen and made necropsies on well-marked cases, and even on cases of cardiac aneurysm with rupture of the ventricle. But while he was at Johns Hopkins Hospital, Baltimore, in 1924, he had the opportunity of studying closely three typical examples of coronary thrombosis and its clinical syndrome. Apparently there was a considerable American literature on the subject. In 1925 he wrote about the condition in this country, and later Dr. John Parkinson and Dr. Evan Bedford did likewise.

When the clinical syndrome and its variations became known a number of instances were recorded; he had seen four cases in the practice of a single general practitioner. He was sure that the question of coronary thrombosis would often arise as a problem of diagnosis in general medicine, or even in general surgery, in patients in whom there had been no previous reason to suspect disease of the heart or vascular system at all. As to the reason this important cardiac disease had been so long missed out of text-books in this country, and by clinical teachers, he thought it was because such great teachers as Mackenzie, Allbutt, and Osler did not separate coronary thrombosis from angina pectoris. It was clear from the books of Clifford Allbutt that many of the cases included by him as "status anginosus" were really instances of coronary occlusion. Yet it was very important to distinguish coronary thrombosis from angina pectoris, because course and prognosis differed so widely. Typical angina pectoris was a fairly frequent precursor of coronary thrombosis, but after the thrombosis all further true anginal attacks usually ceased. The anterior descending branch of the left coronary artery was the vessel most commonly thrombosed; this branch carried blood to the apex of the left ventricle, the left anterior third of the right ventricle, and part of the interventricular septum. Hence thrombosis in it caused an infarction involving both the left and the right cavities of the heart, and mural thrombi occurring on the infarcted area might pass as emboli either to the lungs or to the systemic circulation. Levine had shown that the predisposing causes of coronary thrombosis were the conditions which brought about arterial degeneration; certainly a part, too, was played by a hereditary tendency to arterial disease. Angina pectoris was a common precursor. The male sex suffered from coronary occlusion rather more than the female. Rarely was it seen before the fortieth year.

Trendelenburg position depends upon whether a short or long column of solution has been created within the dura. Inconvenient spread may take place from a large injection even if only slightly hyperbaric. An isobaric solution will stay where it is put.

Behaviour of a Hypobaric Solution.—These solutions have revealed for the first time the characteristic action of a genuine "light" solution. The condition which results in the dorsal decubitus is a preponderating anterior root block with little or no effect on the posterior roots, thus the entire abdominal musculature may be paralysed, yet the patient will be in an inoperable condition unless a general anæsthetic is given. This effect is also recognisable when towards the end of a long operation the patient feels pain but no rigidity accompanies it, and closure of the wound in the abdomen is effected without difficulty. Another demonstration is the greatly exaggerated peristalsis amounting to spasm, due to the more effective paralysis of the efferent inhibitory fibres of the splanchnics contained in the anterior roots. All this occurs in spite of the fact that sensory fibres are more easily affected than motor fibres. It is thus evident that the percain solution has applied itself in greater concentration to the anterior roots than to the posterior. This preponderating anterior root effect is in striking contrast to the preponderating posterior root effect of the small volume heavy solutions spread by gravitational diffusion, and shows a reversal of results. It is therefore necessary when using hypobaric solutions to put the patient in the ventral decubitus after injection in order to soak the posterior roots and develop analgesia, and when he is finally turned on his back the anterior roots will be affected and muscular paralysis follows. He is safe from spread when prone, for the neck will be lower than the upper dorsal region; but when turned on his back the slight Trendelenburg position should be adopted for a time as a precaution. As it is impossible to know beforehand the specific gravity relationship of the normal saline solutions, it will probably be better practice to use in all cases the definitely hypobaric 0·5 per cent. saline solutions (spec. grav. 1·0034) in all strengths of percain, never omitting the technique of the grill-room chef. Strictly limited caudal blocks are possible with small volume hypobaric solutions of percain, which may be used in higher concentrations for this purpose, relying on dilution in the cerebro-spinal fluid but even 6 c.cm. of 1–1000 solution between L4 and L5 may leave the greater part of the lumbar plexus unaffected. These effects of hypobaric solutions constitute a strong criticism of the pseudo-hypobaric spinocain, which although of low specific gravity in the ampoule, can only act in the same way as a heavy solution when mixed with cerebro-spinal fluid, and the clinical results of which are eloquent of gravitational diffusion—viz., preponderating posterior root effect and diminishing concentration from below upward.

General Effects of the Injection.—There is a fall of blood pressure due to vaso-motor paralysis. The fall is not nearly so great as after large doses of novocain, and this is because the high dilution of percain renders sudden absorption into the blood stream impossible. Novocain collapse is due chiefly to general poisoning by the drug following rapid absorption from the more concentrated solutions necessary for effective results. The percain patient, therefore, remains in much better condition on the operating table than those who have had novocain. Ephedrine gr. 1 to 1½ may be given in all cases. Analgesia can be obtained which outlasts the longest abdominal operation.

Respiratory Failure.—The phrenic nerve roots are not likely to be reached directly by these volume doses. Central failure is a possibility which must be watched for especially toward the end of a long operation. The more effective paralysis of the anterior roots of the intercostal nerves results in pure diaphragmatic breathing, and a virtual impediment to respiration causing fatigue of the centre. Shallow breathing, imperfect ventilation of the lung, and anoxæmia operate as a vicious circle progressively increasing central fatigue and tending to arrest. If narcotics have been given this tendency will be much greater. Carbon dioxide and oxygen is the correct treatment, and any dusky colour in the patient is an indication for oxygen. If a combined general anæsthetic is used the closed method with oxygen is an insurance against respiratory failure. Failures with percain will be failures of technique. After-effects are the usual symptoms of "meningism," headache, and vomiting experienced occasionally after other drugs and even after simple puncture.

There have been no disastrous consequences from percain injections, said Dr. Howard Jones in conclusion, and there is little reason why there should be. The maximum dose of 20 mg. required in the spine compares favourably with the 100 to 200 mg. used in the tissues, and 7·5 to 10·0 mg. are more effective than 150 mg. of novocain.

MEDICO-LEGAL SOCIETY
AND
WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

AT *a joint meeting of these Societies held at* 11, Chandos-street, on March 7th, Lord RIDDELL, President of the Medico-Legal Society, took the chair, and a discussion on

THE DOCTOR IN THE LAW COURTS

was opened by Sir WILLIAM WILLCOX. A medical practitioner, he said, might be called as an ordinary or as an expert witness. Even in the former case he was often asked to give an opinion; he should always ask to be excused if he was not absolutely sure of his ground, and the judge would probably support him. In giving evidence of fact he should avoid technical terms as far as possible, and should not make comments. The expert's true function was to assist the court, and he should be absolutely free from bias; this was supremely essential in criminal cases. Before coming to court he should study carefully the most recent literature of the subject; turn and turn over in his own mind every aspect of the matter, and cross-examine himself as severely as possible from the point of view of the other side. Written reports should contain nothing that the witness might have to repudiate afterwards. Sir William was strongly in favour of a separate preliminary conference between the experts called on each side, to clear up doubtful points and enable them to arrive at complete agreement. This was of great help to the court. Answers to cross-examination should be as concise and clear as possible, and the witness should avoid long explanations and evasion of the direct answer. Where he could not answer yes or no, he should give his reasons clearly and courteously. If the question were multiple, he should, if necessary, ask that the component parts of it be put separately. When statements in books or reports were put to him, he should ask to see the document before replying. An expert witness was usually required to attend in court during the whole case, for it was sometimes necessary to question him on his opinion concerning the evidence in general. Coroners' courts admitted much hearsay evidence, but the doctor should refrain from giving it. On the question of professional secrecy, Sir William thought that the confidences of a patient were sacred. They should only be divulged on the direct order of a judge, and then only under strong protest. Finally, the medical witness should not try to introduce points from his report that his counsel did not raise; there might be a special reason for the omission.

Privilege.

Lord RIDDELL said that many doctors envied the lawyers what they believed to be their privilege. The lawyer was not entitled to any privilege; the privilege was that of the client. He alone might say what his lawyer might or might not disclose. This right, however, was very limited, and did not protect a client charged with a crime. A maxim that Sir William had not mentioned was "He who vegetates in the witness-box is lost." The professional witness must have all his wits about him, and it was also a great advantage to look simple and honest. Moreover, a good-tempered witness was very difficult to shake, but one who was conceited or vain was in considerable danger.

Sir William Collins remarked that the Regulations made under the Venereal Diseases Act had laid down that information conveyed by the patient to the doctor should be absolutely confidential and privileged; a doctor had nevertheless been compelled by the judge to violate such a confidence. He himself should have preferred to resist, even to the point of being committed for contempt of court. The reason why priests were never required to reveal the secrets of the confessional was that they would certainly choose the alternative of imprisonment. The judge should have the right to the doctor's evidence in many criminal cases, but in cases within the mental and moral arena the doctor should refuse to violate the patient's confidence. He did not think that consultations between the expert witnesses on both sides would serve the ends of justice. He thought that the medical man would be much improved as a witness if a course of formal logic were part of the curriculum for a degree.

Dr. F. Temple Grey commented on the absence of uniformity in the views of the medical profession on the question of secrecy as expressed at various times, and suggested that the British Medical Association and the Medico-Legal Society should together formulate a code of conduct for the guidance of younger members of the medical profession in these matters. The view that medical confidence should be absolutely privileged was no fantastic one and was law in France. The absence of such a provision in English law might, however, be regarded as a compliment to the reticence of the profession in this country. The Hippocratic oath bound the doctor not to divulge anything that ought not to be divulged, a qualification which was often forgotten. If the law required certain evidence, then that evidence ought to be divulged, and the question was whether the law ought to be changed. He agreed with Sir William Collins that the time was ripe for some form of compromise. He proposed that disclosure should be limited to evidence of fraud, crime, and matters in which the public interest demanded disclosure. It was in the public interest that the confidence of the venereal patient should be protected as much as possible. Patients treated in venereal disease clinics should be known only by numbers.

Mr. W. McAdam Eccles exhorted expert witnesses to stick to the truth, and to appeal to the judge if the form of the question made this impossible. The "whole truth" demanded that an expert witness should be completely impartial. It was a defect of the practice of the courts that medical practitioners were regarded as all on the same plane; it should be recognised that the value of their opinions differed considerably on different subjects. Mr. McAdam Eccles was against conferences of experts, but advocated that the expert witnesses on either side should have an opportunity to confer with the medical assessor or referee. The judge, in his experience, frequently attended at such a conference.

Lieut.-Colonel C. T. Samman said he did not agree that the medical witness suffered financial loss through attendance at court.

Dr. A. Knyvett Gordon held that no pathologist should ever give evidence on the significance of any tests he made unless he had seen the patient, for the error precluded certainty.

Dr. Julius Burnford pointed to the success of the preliminary conferences which had been the rule at Leeds owing to the determination of Sir Clifford Allbutt. They had eliminated the unseemly disputes between doctors and lawyers which were common elsewhere.

The Chairman commented shortly on some of the points that had been raised.

EDINBURGH OBSTETRICAL SOCIETY.

At a meeting of this Society on Feb. 12th, with Dr. H. S. Davidson, the President, in the chair, a paper on

Chronic Infection of the Cervix

was read by Dr. James Young. The condition, he said, was ten times more common in parous than nulliparous women, and the chief cause was damage of the cervix during labour. Gonorrhœa was the next most important cause. The most characteristic pathological feature of the condition was its intractableness, and this was due to the structure of the endocervix and to faulty drainage. The two most constant clinical features were leucorrhœa and pain. Menstrual irregularity and excess, bladder and bowel troubles, and general ill-health with arthritis and cardiovascular disease were also common. Dr. Young believed that chronic cervicitis was, with the possible exception of vaginal prolapse, the most common gynæcological cause of pelvic and abdominal pain. The chief site of this pain was the iliac fossa and the sacro-coccygeal region, and, as a rule, its relation to the cervix could easily be determined on vaginal examination. In health, displacement of the cervix laterally, antero-posteriorly and upwards could be produced with the vaginal fingers without inducing pain. In cervicitis fixation of the cervix was common, and any attempt at displacement immediately called forth the low abdominal or back pain. Many women suffered from nausea and, in such, retching was often caused by the same manœuvre. Dr. Young suggested that the pain was caused by irritation of the local sympathetic fibres and the somatic registering of these irritant impulses via the central nerve connexions. The iliac fossa pain of cervicitis was apt to be attributed to appendicitis or ovarian or tubal mischief. Treatment directed solely to the cervix often led to a cure of the menstrual abnormalities, and these were probably to be explained by a reflex influence on the ovaries through the sympathetic with consequent aberrant ovulation. Dr. Young discouraged vaginal douching as a treatment of cervical infection. It rarely did good, and it often did harm. Caustics and diathermy had been equally inefficacious in his hands. The lesion—dependent, as it was, on faulty drainage—could best be treated by thorough dilatation of the cervix and application of the cautery from internal to external os. Six long longitudinal smears were usually sufficient with, in addition, an individual and deep puncturing of any Nabothian follicles. The after-results showed that with a single cauterisation carried out thoroughly, cure or relief of the leucorrhœa and pain could be obtained in 70 to 80 per cent. of the cases. Relief of the other symptoms (menstrual, vesical, &c.) usually followed, and cases showing a dramatic arrest of an active and progressive arthritis were recorded.

Dr. Turner and Dr. James Davidson communicated a paper on

Symmetrical Necrosis of the Renal Cortex.

Two cases in Dr. Turner's practice were described. Both the patients were multiparæ; one, aged 37, had had four children, and the other, aged 39, had had three. Both were delivered of macerated fœti at the seventh month of pregnancy. In the first case there was an antecedent history of pre-eclamptic toxæmia and accidental hæmorrhage, but in the second no abnormality was observed during the antenatal period. Both patients lived for 12 days after delivery, and during this period the urinary secretion diminished (19 oz. in the first and 8 oz. in the second case). In both cases there was a comparative absence of growth just above the sphincter is not suitable for radium treatment on account of post-radiation discomfort. A large group of surgeons is likely to agree with these conclusions.

BOOKS FOR NURSES.

Elementary Materia Medica. Including Drugs and Solutions. By WALTER W. KRUEGER, Ph.B., Instructor, The Grand Rapids Junior College. London: W. B. Saunders Co., Ltd. 1929. Pp. 278. 8*s*.

THE output from American sources of text-books for students of nursing is an indication of the attention which the authorities are giving to the training of nurses, but the books all suffer from the same defect; they contain far more information than a nurse in training can possibly assimilate. Mr. Krueger's book is not exceptional in this respect, though in some ways it is an interesting production. In addition to the usual chapters dealing with the elementary, and for the nurse important, aspects of materia medica, such as the administration of medicines, the therapeutic classification of drugs, and the preparation of solutions, the author has introduced a chapter of general interest in the form of a sketch of the historical background of modern materia medica. He recognises also that figures may not come easily to a nurse, so he has added a simple chapter on numbers, fractions, and decimals. The book is readable and accurate. The elaborate bibliographies at the end of each chapter could quite well be dispensed with. They indicate a want of appreciation of the actual requirements of a nurse's training.

Nursing Care of Communicable Diseases. A Textbook of Prophylactic Technics for the Prevention and Control of Disease. By MARY ELIZABETH PILLSBURY, Instructor of Communicable Disease Nursing, Yale University School of Nursing. 1924–27. London: J. B. Lippincott Company. 1929. Pp. 413. 12*s*. 6*d*.

MANY nurses come to the end of their hospital training with but a scanty knowledge of communicable diseases, and in this American manual they may find a useful text-book. It is written in an interesting style and contains much information about the American public health services, stressing the duties of the nurse as a teacher of the public in matters of health. The second part of the book is devoted to the discussion in separate chapters of the various better-known infectious diseases, each disease being viewed from the medical and nursing aspects. In connexion with scarlet fever, while throat irrigation is mentioned, there is no reference to spraying of the throat, which is usually found more effective for the relief of pain both in scarlet fever and diphtheria. The book is illustrated by photographs; some of these are useful in conjunction with the description of nursing technique; the black and white attempts at reproducing the appearance of skin eruptions are not successful. Blank pages for notes are provided at the end of the book; in a later edition these might be more conveniently placed in front of the index.

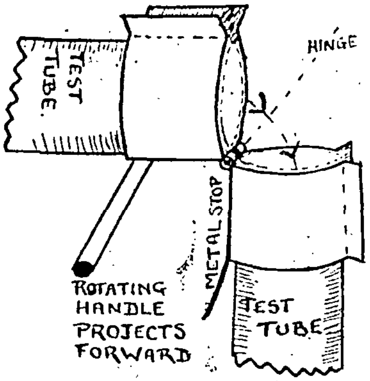
JOURNALS.

EDINBURGH MEDICAL JOURNAL.—The March issue is a special Tuberculosis Number. The first article by Dr. W. T. Munro, on Bovine-Type Tubercle Bacillus in Pulmonary Tuberculosis: Its Rôle in Pathogenesis, is annotated on p. 584.—Dr. D. Melville Dunlop writes on the Sedimentation Test in Tuberculosis, and on the Leucocytic Reaction to Tuberculosis, both in relation to their value in prognosis; and also has a third paper on the Relation between Glandular and Pulmonary Tuberculosis. In the first he comes to the conclusion we believe to be now generally accepted that the sedimentation-rate is an expression of the degree of activity of the disease, but is by no means infallible, and should never be taken alone as a prognostic index or as definite evidence of activity or inactivity. His second article on the leucocytic reaction contains the results of white cell counts from tuberculosis patients in the Southfield Sanatorium Colony. Here he notices that in health the ratio between the neutrophiles and lymphocytes is less than the ratio between the lymphocytes and monocytes. This picture is reversed in tuberculosis, and the more it deviates from the normal the worse the prognosis. In his third paper Dr. Dunlop reports that out of the last 68 cases of pulmonary tuberculosis which have been treated in the Colony, 13 have been associated with a history of disease of the cervical lymph glands, which represents a percentage of 18·9 as against 1 per cent. quoted by other authorities.—Dr. R. S. Begbie contributes a short paper on Microbic Dissociation, with special reference to Certain Acid-fast Bacilli, in which, following the lines of the work of Petroff, he has isolated rough and smooth colonies from cultures of B C G, the smegma bacillus, and Clegg's lepra bacillus.—A short note on Inoculation of Calf with Human Tubercle Bacillus, by Sir Robert Philip, Dr. J. C. Simpson, and Dr. Dunlop, records the successful production of tuberculosis in a calf by the ingestion of tubercle bacilli of human origin.—Two articles deal with social aspects of disease: one on Education of the Public in Health Matters, with special reference to the Work of the National Association for the Prevention of Tuberculosis, by Dr. William Brand; the other by Dr. A. Morrison McIntosh on Difficulties in Assessing the Capacity for Work of Ex-Sanatorium Patients.

New Inventions.

EXCRETA EXAMINATION DEVICE.

THE small device here illustrated facilitates the examination of excreta, and is inexpensive. It consists of a pair of metal clips united by a hinge. Attached to the right clip is a small metal "stop" which prevents the test-tubes touching each other. Projecting forwards from the left clip is a 10-inch rotating handle provided with a ring at end. Ordinary test-tubes are fitted into the clips. The advantages gained by this device are as follows: 1. The hands do not touch the test-tubes and so remain dry for the recording of results. 2. Burning and scalding accidents prevented when pouring. 3. Spurting when mixing is checked, the ejected fluid being received into the uppermost empty test-tube. 4. Thorough mixing of liquids the tubes may be shaken when horizontally opposed. 5. The appliance stands on the table like a tripod until reaction occurs. 6. The tubes are cleansed easily (together) under the tap and can be used singly or together. 7. The device hangs up when not in use. The makers of the appliance are Messrs. S. Murray and Co., Ltd., 11/13, Farringdon-road, London, E.C.



DAVID A. HERD, L.R.C.P., L.R.C.S. Edin.

THE LANCET.

LONDON: SATURDAY, MARCH 15, 1930.

CLINICAL RESEARCH AND EXPERIMENTAL MEDICINE.

IT will probably strike any reader of the detailed summary of the year's work given in the Report of the Medical Research Council for 1928–29,[1] or in any of its predecessors, that most of the research work supported is conducted in laboratories, and that on the whole a very small part of it has been done by men engaged in clinical medicine. The Council themselves draw attention to this circumstance, and find therein a text for an admirably clear and fair review of the relation of medical research to clinical responsibilities. Is there, they ask, a science of experimental medicine of which the actual material for study is the human patient? Or is scientific work by the physician or the surgeon limited to the application in his art of scientific results worked out elsewhere in the laboratory and delivered to him for use? Certainly there is not yet in the field of clinical medicine any stabilised or organised branch of science with a system of recruitment and promotion in the Universities. In their attempt to define the position, the Council draw a clear distinction between the work of the physician engaged in practice and the work of a man engaged in the task of advancing knowledge. The expression of this distinction evokes at first glance that sense of indignant protest which modern psychology recognises as man's natural reaction to unacknowledged and unpalatable truth. The Council state boldly that the proper performance of either of these two kinds of work tends to exclude the proper performance of the other; that the training for one is compatible with the training for the other only along part of the way. The work of a physician, and still more of a general practitioner, is devoted essentially and primarily to the task of diagnosis (not diagnosis in general, but diagnosis of the state of the particular patient), and thereafter to the treatment suitable both to the body and to the mind of that patient. The physician needs good and trained powers of observation, as well as quick, intuitive decision that only inborn aptitude and long years of experience can bring. His skill is rooted, of course, in scientific knowledge, and in his art he will make every application of the latest results of science. In the interests of his patients, however, he will be unable to make the advancement of scientific knowledge a primary object.

The research worker in the clinical field, on the other hand, must take a different point of view and follow a different discipline. He must ignore individuality, obliterate it by multiplying cases, and study the disease process as such. His thoughts must be concentrated chiefly upon the task of getting new knowledge in his chosen inquiry by every experimental method open to him, whether at the bedside or in the laboratory. It is just here that his immense difficulty lies—that of deciding what experimental methods are justifiable. In facing it the Council are less outspoken than in their appreciation of the problems of the practising clinician. They say, "Since human beings are to be the material of his study, he must learn, of course, to deal with them with the same unselfish solicitude as that of any of his brother physicians." This, it may be held, is elementary medical ethics; but situations must arise where the conduct of a collective controlled experiment in therapeutics may interfere with the welfare of an individual, and then the duty of a physician to his patients must conflict with and hamper his zeal for experimental research. Certain peculiarly able men, ingenious enough to devise questions which involve few such struggles, or fortunate in that their tastes lead them to investigations where observations made on human beings can be tested on experimental animals, are contributing notable advances to scientific medicine, in which their results are hardly less rigidly controlled than any of those recorded in laboratory work. Among them one name stands out. The Medical Research Council recall that in 1916 the appointment of Sir THOMAS LEWIS, already a physician attached to University College Hospital, to be a member of their whole-time staff, with suitable assistants, initiated the first effective hospital unit in this country. Their claim that the output of work from this centre in the scientific study of the heart and blood vascular system, its disorders and their treatment, has constituted the central stream of progress made in these subjects in any country, will be generally admitted. By contrast with this achievement some disappointment is implied, though not actually expressed, with the output of the professorial clinical units in surgery and medicine attached to the medical schools. A decade has now passed since they were inaugurated with the object of giving higher and more advanced teaching as well as organising elementary instruction in clinical subjects. They were to impart to the more able students such qualities of trained critical judgment as would fit them for the best kinds of practice, while at the same time they were to train others for an academic life of scientific clinical research. The remarkable success with which the functions of clinical teaching have been performed is here acknowledged. But these important duties, and that of taking a fair share in the administrative work of the medical schools, have tended to divert energy from other tasks and have "necessarily limited the volume of spontaneous and successful research work" coming from the units in the aggregate. Reasons of another kind are also suggested for the fact that the assistantships, whether in these university units or in the research unit under Sir THOMAS LEWIS, have not hitherto produced many men able and willing to devote themselves to a life of clinical research in experimental medicine. One is the novelty of a career in which a man is neither exactly a physician nor exactly a laboratory worker. The other and weightier factor is the absence of stable positions in which such a career may be pursued and developed with proper facilities and with reasonable remuneration. A man well trained as a clinician as well as skilled in laboratory work is thus tempted to exchange the present uncertainty of promotion and ultimate reward in scientific clinical work either for the relative certainties of professional practice, or, if he has private means or simple tastes, for an academic career in these sciences ancillary to medicine where professorial chairs are fairly numerous. These are certainly defections from the point of view of breeding whole-time clinical researchers, though for obvious reasons we should hesitate to deplore them if the succession were assured. A tendency at some of the great hospitals for the medical and surgical units to be regarded as recruiting grounds for the staff has been apparent; and this is certainly a useful way of gradually widening the scientific horizon of the honorary staff, a group whose outlook on medical problems has an incalculable influence on generations of students and therefore on British medicine. It is obvious, though, that if clinical research is to absorb a due amount of the annual grant of £150,000 placed in the hands of the Council for distribution, more men must be found who are permanently willing to devote their lives to this end. The conclusion reached by the Council is that

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[1] London: H.M. Stationery Office. 1930. Pp. 153. 3s. An account of some of the researches carried out in the year under review will appear in a future issue of THE LANCET.

> "there can never be a successful and maintained recruitment of young men of ability for clinical research until there are at least a few stable positions in sight, the occupation of which at middle age will provide reasonable remuneration and adequate power of educating a family. It was hoped originally that the directorships of the University clinics in London, with others that might be established elsewhere in the provinces, would provide posts sufficiently numerous and attractive to keep the abler men at the work of investigation with the ambition of succeeding to them. But a young man able enough to advance knowledge is not likely to be attracted by a post to which he might be appointed in the future if his occupation of it is to bring such burdens of teaching and administration as would greatly debar him from the very research work that it is his ambition to pursue."

The Medical Research Council are trying to meet the situation by a statement of their intention to encourage still further the scientific and direct study of disease in man. They wish to recruit for this purpose young workers of ability, to help them during a preliminary period of training and probationary work, and, when they are able, to select candidates whose training is adequate and whose efforts show promise to increase the number of clinical workers on their permanent staff.

We are impressed with the arguments in this carefully worded section of the Council's introduction to a masterly Report. No hint is given of the type of training to be offered, but doubtless this will follow the time-honoured lines of apprenticeship to one with knowledge of the difficulties involved, or association with a team of workers. Whatever form the discipline takes, it is to be hoped that an elementary grounding of statistics as applied to medicine will be imperative. Where the material available for study is so precious, and sometimes so difficult to come by, it is unjustifiable to waste it by planning work which, examined statistically, is of little value compared with the controlled observations that might have been made. Criticisms offered, and legitimately offered, on the outcome of laborious work which has extended over years are sometimes resented. It is pardonable to be disheartened if figures honestly collected are found to be meaningless, but not to condemn statisticians for exposing fallacies due to ignorance of proper methods. Where many unknown factors can be eliminated, as in a well-constructed laboratory experiment, the need is perhaps not so great; but the assessment of clinical research, to be economical, requires either great experience, natural ability, or some knowledge of the laws of probability and averages. A significant sentence in the section on Statistics (p. 123 of the Report) reads, "Much time and energy have again been used in giving statistical help to research workers in other departments." It is unlikely that a brief training in applied mathematics would make it possible to dispense with the assistance available from Prof. MAJOR GREENWOOD and his staff, but it might at least enable them to economise some of the "time and energy" so generously offered to other workers.

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ÆTIOLOGY OF DISSEMINATED SCLEROSIS.

DISSEMINATED sclerosis is one of the commonest chronic diseases of the nervous system. In England it ranks second only to neurosyphilis in frequency; in Switzerland it holds the foremost place. But in spite of its prevalence its cause has hitherto remained in doubt. Until the present century even its pathological nature was much disputed. Histological study, however, tracing the "sclerotic plaque" to its earliest stages, has there discovered all the manifestations of inflammation in the nervous system, and increasing knowledge of neuroglia has led to the recognition of the glial "sclerosis" as an inflammatory reaction rather than a neoplastic hyperplasia. Hence disseminated sclerosis is now almost universally regarded as an encephalomyelitis characterised histologically by neuronal demyelination and clinically by its relapsing tendency. This conception has naturally led to the search for a causal organism, and to many conflicting observations. Some workers have claimed to have transmitted a neurotropic virus of unknown nature from cases of disseminated sclerosis to animals. Others have impugned a spirochæte. Many completely negative experimental observations have been recorded, and no positive claim has gained general acceptance. To-day we publish a paper by Miss KATHLEEN CHEVASSUT, bringing forward evidence in favour of the view that the cause of disseminated sclerosis is a filtrable virus which she claims to have isolated from the cerebro-spinal fluid of a large number of patients. This discovery, if it is substantiated, will certainly rank among the foremost achievements of bacteriology. Other bacteriologists will doubtless avail themselves of the opportunity of repeating Miss CHEVASSUT'S experiments. This, however, must take time. In the meantime it is desirable that her claim should be subjected to all possible well-informed and fair-minded criticism, and that hasty acceptance and rejection should equally be avoided.

Miss CHEVASSUT first describes some original observations upon the colloidal gold reaction in the cerebro-spinal fluid and blood-serum in disseminated sclerosis which she interprets as indicating that this reaction "is related in some way to the causal factor." She then brings forward evidence that "in a high percentage of cases of disseminated sclerosis there is deficiency in the antitoxic and metabolic functions of the liver." Both of these conclusions are open to criticism, but they have no direct bearing upon her main thesis. She reports that in a special medium, Hartley's broth to which human blood-serum has been added, she has succeeded in growing an organism which, when examined microscopically by a special technique, appears as spherical bodies, some of which have granules attached to them. She has cultivated this organism from the cerebro-spinal fluid of 176 out of 188 cases of disseminated sclerosis, and has found it present in all stages of the disease. She describes the conditions affecting its growth and has observed that it ferments glucose, lævulose, and mannite

The granules have been shown to pass through collodion membranes. These positive observations have been controlled by culturing the cerebro-spinal fluid from 269 persons suffering from other conditions, always with negative results. Miss Chevassut, then, appears to have demonstrated the presence of certain bodies in cultures made from the cerebro-spinal fluid of patients with disseminated sclerosis. Is she entitled to conclude that these bodies constitute the causal organism of the disease? We must now consider how this conclusion might be criticised, not necessarily as incorrect, but as requiring further evidence before it can be regarded as proved. The bodies have never been demonstrated in the cerebro-spinal fluid itself. There may be good technical reasons for this, as Miss Chevassut suggests, but if these difficulties could be overcome it would go far to remove the possibility that the supposed organisms may be products of the interaction of the fluid and the culture medium. It may be strange to regard the uniformity of the success of an experiment as evidence against its validity, but workers with the filtrable viruses may be inclined to regard the demonstration of the virus in 93 per cent. of the specimens examined as almost too good to be true, especially when the material is derived from quiescent as well as from active cases. It may be suggested that some bio-chemical change in the fluid is more likely to be thus constant than the presence of the organism. It seems desirable, too, that some attempt should be made to ascertain whether the virus is obtainable from nervous tissue as well as from cerebro-spinal fluid. It is naturally the aim of all who claim to have isolated an organism to transmit it to animals, to show that in inoculated animals it produces the symptoms and histological changes of the disease in man, and that it can be recovered and cultivated from animals thus infected. The evidence that these tests have been successfully carried out with Miss Chevassut's organism is at present inconclusive.

Sir James Purves-Stewart, in the paper on p. 560, summarises experiments which he has carried out in conjunction with Dr. Braxton Hicks and Dr. F. D. M. Hocking, and which will be fully reported in our next issue. It is disappointing that more striking results were not obtained from such drastic inoculations as the intravenous and intracisternal injections of cultures of the virus into monkeys. Possibly the monkey is not a susceptible animal, though G. Steiner has described the successful inoculation of a monkey with the disease. Perhaps intracerebral inoculation would yield better results. There is nothing in Miss Chevassut's observations inconsistent with her view that she has isolated the organism of disseminated sclerosis, but the proof of her contention can hardly as yet be regarded as complete. We sincerely hope that further investigations will prove her right, and neither she nor Sir James has spared pains in their admirable work.

We turn now to the practical applications of the observations we have been discussing. An exceedingly important one is entirely independent of their interpretation and, curiously, has not been mentioned either by Miss Chevassut or by Sir James Purves-Stewart. Whether or not the *Spherula insularis* is the cause of the disease, if the existence of these bodies is confirmed their diagnostic value is clearly very great. A test applicable to the cerebro-spinal fluid which yields a positive result in 93 per cent. of cases and is pathognomonic of disseminated sclerosis, will be an even more valuable aid to the diagnosis of this disease than is the Wassermann reaction in neurosyphilis. It will be of great use in early cases, and also may be expected to throw light upon the relationship between disseminated sclerosis, neuromyelitis optica, and other forms of demyelinating encephalitis. The isolation of a causative organism suggests the therapeutic employment of an autogenous vaccine, and Sir James Purves-Stewart contributes a weighty paper setting forth the results achieved by means of killed cultures of Miss Chevassut's organism. He wisely emphasises the need of caution in drawing conclusions as to the effects of any therapeutic measure in disseminated sclerosis. His patients have apparently only been under treatment for one or two years, a time too short to permit one to speak with confidence of clinical arrest. The clinical improvement which occurred in the four cases fully reported is not greater than may occur spontaneously. Sir James Purves-Stewart lays stress upon improvement in the colloidal gold and globulin reactions in the cerebro-spinal fluid. The significance of these changes could have been better appreciated if controls had been investigated. J. D. Ayer and H. E. Foster have observed spontaneous variations in the colloidal gold-curve corresponding to progressive and stationary phases of the disease, and Adams, Blacklock, Dunlop, and Scott have found a diminution in the curve following treatment with salvarsan. The disappointing feature of the vaccine treatment is the fact that after treatment the organism was still obtainable from the fluid in 62 out of 70 cases. This fact, of course, has no direct bearing upon the question of the specificity of the organism. The discovery of the tubercle bacillus and the *Treponema pallidum* has not led to the cure of tuberculosis and syphilis by means of vaccines. Disseminated sclerosis, another relapsing disease, seems to offer a rather unpromising field for such treatment, for natural immunity, at least, appears to be short-lived.

Miss Chevassut, Sir James Purves-Stewart, and their collaborators have laid before the medical profession observations of great interest, involving matters of technical difficulty in more than one department of science. The work required for their confirmation must necessarily take many months. In the meantime, the wise (among whom we may include the lay press) will suspend judgment.

HEALTH AND EMPIRE.

The Hastings Lecture delivered by Sir Andrew Balfour in the Hall of the British Medical Association last Wednesday, a brief abstract of which will be found in our front pages to-day, is an eloquent plea for the development of medical research, with the development of the British Empire as the source of the information given and of the arguments set out. He paints a picture of a great battle between man and disease as witnessed in the various phases of the expansion of British rule. The story of tropical disease to-day is sufficiently tragic, but the ravages of endemic, epidemic, and incidental disease which occur within our borders in the twentieth century represent but a small fraction of the horrors which in the previous epochs decided the fates of armies and navies, and slew, or harassed to the point of death, the pioneers of colonial expansion. And when we speak of previous epochs it should be recalled that many of the diseases, now labelled tropical, until the middle of the nineteenth century flourished in our midst. Sir Andrew Balfour reminded his hearers that as late as 1866 cholera was present in England and that three years later relapsing fever was claiming victims in the poorer parts of London. As a matter of fact, at Somerset House deaths were registered from this cause over England for the next thirty years, though it is probable that there was here sometimes a confusion between relapsing fever and other forms of infantile fever. Malaria may be considered as absent now from the home shores, but the part played by ague in the country practitioner's responsibilities finds record up to mid-Victorian days.

Truly we have but just passed from the shadow of these diseases, and a pertinent lesson to be derived from the Hastings Lecture is that it was an apathy bred of ignorance which left us, in common with the rest of the world, so long their prey. Are we learning our lesson? Some two generations have now gone by since the establishment of compulsory education in this country, and with the disappearance of the illiterate it has become possible to diffuse general ideas of sanitation and general instructions for the preservation of health to a population who can follow the teaching. And during the last 15 years a remarkable impulse to the propagation of such teaching has been given by the experiences derived from the recent war. Those who expected that a newly educated public would at once become docile and receptive of wise teaching must have been sanguine, for the first result of popular education was the creation of a large class whose equipment just encouraged them to criticise what they did not understand, while it provided them with no opportunities and no incentives for pursuing their studies in such a way as to render their imperfect knowledge of greater use to the community, or of more solid comfort to themselves. That at any rate was the position which, until lately, the bulk of the population occupied in respect of medical science and medical endeavour. The nineteenth century may have been slow to organise the national fight against disease, but until recently the public conscience has not been roused by medical warnings. Now on all sides there are signs that the general public is awakening to the fact that in its own hands lies much of the power to prevent disease, to limit its spread, and to alleviate its miseries. The significance of their freedom from much of the sufferings of their parents and grandparents is perceived. At home we are reaching a stage when real coöperation between medicine and the public is taking place, but much time must elapse before such a state of affairs can be expected in many vast tracts of the Empire where tropical diseases are rife. What might be achieved by the education of the native in elementary hygiene was set forth persuasively by Prof. B. BLACKLOCK in a recent Chadwick public lecture. For the present reliance must be placed largely upon the efforts of experts, and for the training of these the London School of Hygiene and Tropical Medicine, whose activities Sir ANDREW BALFOUR directs, is the great new centre.

Research is the weapon which, wisely yielded, can open up for us paths in the jungle of ignorance, dispelling darkness and gloom and revealing vistas of hope and cheerfulness, health, and longevity. The Hastings Lecture demonstrated how good an ally to health the British Empire had been as a civilising and colonising power. With pride in our vast possessions, however, we must own to world responsibilities. We possess unique and often tragic opportunities of becoming intimately acquainted with tropical disease, and it becomes to us a national duty not only to alleviate and where possible remove the burdens of sickness in the interests of our own citizens, but to collect and sift the evidence by which the world may benefit.

THE REGISTRATION OF INDIAN MEDICAL DEGREES.

THE long and patient negotiations between the Government of India and the General Medical Council, in respect of the recognition by the Council of Indian medical degrees, have, at any rate for the time being, broken down. Since 1922 the Council has been striving to secure the registration of Indian graduates on a plan which will guarantee that their place is due to the possession of a professional training up to the standard required for practice in Great Britain and Ireland. The story, therefore, is a long one, but to detail its closing phases will be sufficient to make the situation clear.

At the meeting of the General Medical Council last November the President pointed out that the period for which the recognition of Indian medical degrees for registration in Great Britain and Ireland had been provisionally guaranteed was fast running out, while the appointment of a Government Commissioner of Medical Qualifications and Standards had not been made. The appointment of this officer was itself a provisional measure designed to furnish the Council with a responsible nominee, whose reports they could accept, until the promised institution of an All-India Medical Council came into material being. Apparently it was hoped by the Indian Government that the appointment of separate inspectors ad hoc would be accepted by the General Medical Council as a substitute for the Government Commissioner, but the reports of these inspectors which had been received were found to contain no reference to any common standards comparable with those which hold good in this country, while they disclosed individual deficiencies in regard to Indian methods of training and testing which could not be overlooked. To put it briefly, the position was that the General Medical Council, though furnished with these ad hoc reports, remained without evidence that the requisites, demanded by the Medical Act of 1886 before legal practice in Great Britain and Ireland can be undertaken, would be forthcoming. The Government of India, although informed of this, and repeatedly warned that the existing position could not continue, remained inactive. The appointment of a Government Commissioner of Medical Qualifications and Standards was not made, although the Council said plainly that registration for practice in this country of the medical graduates of certain Indian universities must otherwise cease early this year. Then, at the beginning of this year, a letter was received from the India Office saying that the appointment of the Commissioner was not possible, but stating that the Government of India proposed to proceed with the appointment of a Board to discharge the duties of the All-India Medical Council until that body came into existence. This Board, the India Office stated, would consist of the Director-General, I.M.S., and representatives of the medical faculties of the Indian Universities, and one of its duties would be to appoint certain inspectors as intermediaries between the Board and the General Medical Council. The Council, in the meantime, had received telegrams from the Viceroy stating that the appointment of the Commissioner was not possible, but putting forward a recommendation, received from a conference of the Indian Universities that, pending the creation of an All-India Medical Council, a Board consisting of representatives of the Government of India and the medical faculties of the Universities should be appointed as a temporary measure. A further telegram from the Viceroy indicated that this Board, being established, would appoint inspectors, specialists severally in medicine, surgery, and midwifery, to report on the standards of Indian medical education and examinations, thus guaranteeing to the Medical Council that the possession of the medical degrees of a particular Indian University "ensured possession of the minimum qualifications accepted for registration in Great Britain."

This was the situation to be considered at a meeting of the Executive Committee of the General Medical Council on Feb. 24th, when it was felt that the perpetuation of temporary remedies for the main difficulty—namely, the possible registration of persons below the legal standard—was inadvisable. For not only had this country to be thought of, but all the overseas dominions. With these reciprocity is earnestly desired, but they will take no steps to such an end if doubts are raised about the standards demanded by the General Medical Council. It was accordingly resolved :—

(*a*) That, in the absence of authoritative information respecting the medical qualifications and standards of the Indian Universities of Bombay, Calcutta, Lucknow, Madras, and Punjab, the Executive Committee of the Council, in fulfilment of its duty under the Medical Act, 1886, Section 13, is unable for the time being to recognise the medical degrees of these Universities as "furnishing a sufficient guarantee of the possession of the requisite knowledge and skill for the efficient practice of medicine, surgery, and midwifery" in this country; and that accordingly the conditional recognition hitherto granted to these degrees has now lapsed.

(*b*) That the proposal by the Government of India to appoint a temporary Board, contained in the letter from the India Office of Jan. 11th, 1930, has been carefully considered by the Executive Committee; but it is unable to accept the proposal as furnishing a satisfactory method of supplying the Council with authoritative information on medical qualifications and standards in India, and with the necessary guarantees of sufficiency.

A third resolution dealt in similar *non possumus* way with the situation at the Universities of Rangoon and Patna, whose degrees have never been recognised. All who have followed the various negotiations step by step will be prepared for the Council's decision. The Council has displayed patience and tact in the prolonged discussions, has taken evidence upon the spot before forming its conclusions, and has formed them only when the lapse of time made action necessary. Upon an important section of Indian students the veto against registration in this country will bear hardly, and especially will their teachers and the authorities of the Indian Universities be unwilling to admit that further delay could not be granted. But those who realise the necessity of keeping medical practice in this country up to an adequate level of efficiency will see that the course taken by the Council is right.

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THE Red Cross Clinic for Rheumatism will be available for treatment on Monday next, and applications for appointments may now be made either by letter addressed to the Medical Superintendent, Peto-place, Marylebone-road, London, N.W.1, or telephone Museum 9441. Representatives of approved and friendly societies, trade-unions, and others interested in the treatment of rheumatism are invited to visit the Clinic and inspect the building and its equipment.

REST ROOMS AT ST. BARTHOLOMEW'S HOSPITAL.—Rest rooms for relatives and friends of patients in St. Bartholomew's Hospital are being provided, at a cost of £15,000, by the butchers of Smithfield. The rooms, which include lounges, a canteen and cubicles, are now approaching completion and are expected to be ready for use a few weeks hence. The money is to be provided by the deduction of 10 per cent. from the total subscriptions to the Derby sweepstake of the Smithfield Mutual Benevolent Fund.

Annotations.

"Ne quid nimis."

CHILD PSYCHOLOGY.

WHAT is it that has led in recent years to the sudden and passionate interest in the child's mind, to a curiosity in discovering not only the lines of its normal development, but the reasons for its strange divergences? Perhaps we are at the end of an epoch in which all our growing mechanical devices are leading us away from the world of nature into one of mechanism, against which however life itself is still strong enough to put up a fight against all processes making for petrifaction. It is not surprising therefore that we should be endeavouring to safeguard the tender plant, the child, while still green and pliable and capable of taking such shape as we think best for its own happiness and for the good of the community. The study of the child has been to many the ground of normal psychology; to others it has been a study for its own sake; to many modern students the study of the child for its own sake is a prelude to understanding the disorders of the child mind which make even for physical disability as well as for anomalies of behaviour. Understanding of these disorders, as Freud and his school have shown us, is a prelude to understanding the disorders of the adult mind. There has been so much written on abnormal psychology of the child in the light of psycho-analysis that students may forget, even if they have at one time been aware of, the contribution made to this subject by those who have made researches in the normal field. We have to be thankful particularly to two pioneers in human psychic origins as manifest in the study of the child mind, Jean Piaget and K. Koffka. In a revised edition[1] Prof. Koffka has given us an acute analysis of the mind of the child from a unique angle, an angle which has illuminated academic psychology as it has not been illuminated for more than a quarter of a century. The study of mental processes as configurations (*Gestalten*) has to many freed psychology from an atomism which enslaved it for many years. It is a psychology which has to recommend it a conformity with the recent researches of Lashly and, more remotely, with Head's conception of aphasia. In Prof. Piaget, whose works continue to be translated and are accessible to all, we witness the production of a new method by questionaire for throwing a light on the mental processes of young children in order to determine the way in which their world is built, the form and function of its conception of the external wold. In his recent volume[2] Piaget gives us the fascinating immediate material for understanding the strange animism and idea of participation which underlies the realism of the child. He analyses the child's attitude towards the objects and forces of nature, and to those who can view his discoveries in the light of the dynamic psychology of Freud, a new vista will be opened up into the recesses of the child's mind. For those who have once entered this Aladdin's cave of child wonder and have studied the transformation from infancy to adolescence, there will be no going back. To guide the new Child Guidance Movement these volumes will be invaluable. The same may be said of a study by Dr. James Drever and Dr. Margaret Drummond.[3] Here, too, we have an analysis of the child mind from the periods of pure instinctual movement and satisfaction to the nursery school. It is, in many ways, a practical expression of the foregoing works, although it does not actually deal with either the methods or problems of Koffka and Piaget.

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[1] Growth of the Mind. Second edition, revised. London: Kegan Paul. 1929. Pp. 388. 15*s*.

[2] The Child's Conception of the World. London: Same publisher. 1929. Pp. 397. 12*s*. 6*d*.

[3] Psychology of the Pre-School Child. London: Partridge. 1929. Pp. 222. 6*s*.

PULMONARY TUBERCLE OF BOVINE TYPE.

THE occurrence of the bovine tubercle bacillus in pulmonary infection has hitherto been considered a rare curiosity of little practical significance. For example, Park and Krumweide, in the United States, only record two instances of undoubted bovine infection in 680 cases of pulmonary tuberculosis, whilst A. S. Griffith, in this country, has found three instances in 212 cases. But Dr. W. T. Munro, of the Fife and Kinross Sanatorium, Glenlomond, has re-examined the matter in the light of a large series of experiments on sputum and pus from cases occurring at the sanatorium, using as his standard of identification of the bovine type its dysgonic growth in culture and its low virulence on intravenous inoculation in rabbits. Details of the viruses are given in a paper which appears in a special Tuberculosis Number of the *Edinburgh Medical Journal* (March, 1930, p. 141). Two years ago in our own columns [1] Dr. Munro gave an account of five cases from whose sputum tubercle bacilli of bovine type had been grown in culture. He has now double this number, ten of bovine type out of 250 cases. In four of these the disease had spread from the root of the lung, five showed the distribution common in pulmonary tuberculosis of human type, and one stood alone with multiple abscesses. Setting this case aside, Dr. Munro notes as the most striking features of the series (1) the amount of fibrotic change, (2) the lack of evidence of much breaking-down of lung tissue, and (3) the absence of hæmoptysis. Although he does not wish to overstress these points he does suggest that there is more chance of bovine tubercle patients overcoming their systemic disturbance than would be the case with a similar group of infection with human type. Dr. Munro then asks certain pertinent questions and endeavours himself to supply answers to them. Why, for instance, are bovine-type tubercle bacilli so rarely found in the sputum of patients suffering from pulmonary tuberculosis? The bovine bacillus being dysgonic it is, of course, more likely to escape attention by those bacteriologists who cultivate and investigate the tubercle bacillus in sputum, and, according to Dr. Munro, it is just when tubercle bacilli are scanty that there is most chance of their being bovine. He is inclined to think that his higher percentage of positive bovine is due to the fact that he has made cultures from every sputum in which tubercle bacilli were present, whether numerous or scanty. Again, he asks, is the bovine virus less capable of generalisation in the human subject than the human virus? Dr. Munro quotes evidence to show that there is a larger percentage of recoveries in bovine-type infections, and he believes it to be a reasonable argument to advance that the bovine type is not so capable of general lymphatic spread in the human subject as is the human type. Referring to Marfan's law of the rarity of pulmonary tuberculosis in persons who during childhood have had suppurative adenitis of the neck, Dr. Munro states that in cases where he has had the opportunity of examining material from both cervical gland and sputum in the same patient he has always obtained the human-type bacillus. Furthermore, tubercle bacilli from kidney lesions are in the experience of most workers almost always of the human type. Going on to consider Aschoff's division of pulmonary tuberculosis into two types, exudative and proliferative, Dr. Munro suggests that the allergic response to the bovine bacillus is more likely to be of the proliferative than of the exudative type, and thinks that when tubercle bacilli are found at the beginning of the illness with a bovine infection they are likely soon to disappear because of this proliferative response. This benign bovine infection may lead to protection against superinfection by the bovine type, while it is apt to break down when confronted with the human type of bacillus. Finally, he asks, is it possible that the bovine disease has been contracted by aerogenous infection? In none of the cases was there any family history of tuberculosis, and in only two was there any account of contact with cattle on farms in earlier years. Dr. Munro remarks: "But when one stops to think of these ten cases of pulmonary tuberculosis due to bovine-type tubercle bacilli, one must accept that it is most unlikely that superinfection was air-borne. And if these cases are not air-borne, is chronic pulmonary tuberculosis ever air-borne?" Subcutaneous inoculation on animals has satisfied him that, contrary to the usual experience, it was possible to produce chronic pulmonary tuberculosis with cavity formation. Experimentally, then, it is not essential for the tubercle bacillus to be air-borne in order to produce chronic disease of the lung.

THE ÆTIOLOGY OF PSORIASIS.

DETERMINED efforts to ascertain the cause of psoriasis have been made. Two main theories are held, the metabolic and the parasitic, the former of which includes the endocrine and neuropathic. A great deal of research, with which the name of Prof. Schamberg of Philadelphia is particularly associated, has been expended on the biochemical side of the problem, but no positive conclusions have been reached. A group of American dermatologists have recently published [1] the results of exhaustive mycological studies concerned with the relatively common occurrence of monilia, a yeast-like fungus of increasing importance in dermatology, in the psoriatic lesions, the fæces, and the blood of patients affected with the disease. The authors make no extravagant claims, but their work has obviously been most carefully done, and nothing has been omitted or over-emphasised with a view to converting readers to the importance of the findings. It was first ascertained that in 100 stools of persons without psoriasis the monilia in question could be recovered in six. In patients with gastro-intestinal disturbance the percentage rose to 40. Normal persons do not harbour the organism on the skin of the elbow (26 cases examined), nor is it a common superinfection in conditions such as eczema, although Castellani and others have isolated it from various lesions, mostly of intertriginous type, in the groins, perineum, and interdigital spaces.

Wachowiak and Fleisher have demonstrated monilia organisms in the blood of certain cases of sprue and other intestinal infections. They state that its significance is not entirely clear, but in view of the fact that ringworm organisms are occasionally present in the circulation in cases of kerion type of tinea, the possibility of a direct connexion between the organism and the disease deserves consideration. Their investigations in cases of psoriasis show that in the first series of 24 persons monilia was found in the fæces in 20, in the blood in 5, and in the skin scrapings in 11. In their second group of 32 patients the organism was isolated from the fæces of 30, from the blood of 3, and from the skin of 9. Skin susceptibility tests with the organism were carried out with due controls and independently by Prof. Strickler, whose results certainly support a specific allergy in affected persons. In 40 cases 31 showed a "strongly positive reaction," and in all the other 9 there was "an evident reaction." Animal tests and attempts to reproduce the disease both in them and in man were unsuccessful. It is clear that Koch's postulates are not fulfilled, and the causal relationship of monilia and psoriasis is certainly not proved, but the connexion is sufficiently striking to warrant further investigation. Another method of study was attempted with only partial success. Cultures of monilia were sterilised and injected into a psoriasis patient in appropriate vaccinal doses. A few cases cleared up for a time, but the majority either showed no result or relapsed, in just the same way as these patients are apt to do after any protein injection. The authors themselves have little doubt that monilia is in some way related to psoriasis. They remind us that it is the undoubted cause of thrush, and has been claimed as the cause of sprue, some cases of bronchitis and pneumonia, and erosio interdigitalis and epidermycosis. That this organism can function as a pathological agent in the production of diseases is not disputed; but here, as elsewhere, the presence of monilia may be only of secondary significance. Medicine teems with examples of such symbiotic relationships. It is generally acknowledged that many of the symptoms of pulmonary tuberculosis are due to streptococci and staphylococci, and that the majority of fatal cases of malignant disease eventually die of sepsis. It is possible that the relatively poor reactive powers, which it is safe to assume for the psoriatic lesion itself, is the probable cause of the relative abundance of monilia organisms to be found there, and also the indirect cause of the invasion of the blood stream by the organism and of its excretion in the fæces.

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[1] THE LANCET, 1928, i., 384.

[1] American Archives of Dermat. and Syph., 1929, xix., 713.

It is surprising that in setting out their conclusions the authors have not discussed the possibility of such a mechanism. Their paper, however, is worthy of consideration as a serious contribution to dermatological research.

THE DRAFT POOR LAW ORDER.

A FEW years ago the Minister of Health found it impossible to proceed with the reform of the poor-law until the relevant existing statutes had been written out in intelligible form. The result was the consolidating Poor Law Act of 1927 which, though it preserved many provisions which were about to undergo drastic reform, offered the reformer a reasonable chance of reconnoitring the ground he was to attack. Something of the same sort seems to be happening to the Minister's poor-law Orders. The tangle of the present Orders has still some strands of a code issued as long ago as 1847. The Minister has produced a new draft Poor Law Order in nine parts, re-writing the previous provisions under such heads as Institutions, Hospitals, Children's Homes, Boarding-out of Children, Apprenticeship, Casual Poor, and Officers and Servants. His draft is expressly stated to be a consolidation of the existing orders with adaptations consequent upon the passing of the Local Government Act of last year. This means that, as that Act abolishes boards of guardians and substitutes the councils of counties and county boroughs, the nomenclature of the poor-law orders is in this and other respects brought up to date in the light of the table of equivalents contained in Schedule 10 of the Act. Other changes have, of course, to be made. References to the overseers disappear because those officials were abolished by the Rating Act of 1925; and the central authority which in 1847 was set up as the Poor Law Board and which in 1871 became the Local Government Board, now the Ministry of Health, must naturally be referred to by its modern title. On the other hand poor relief has not yet been replaced by the new label "public assistance."

The draft Poor Law Order, therefore, it seems, is a mere modernisation of outstanding provisions, a necessary preliminary to any fresh developments. The draftsman appears to have done his work neatly and concisely. The three-page "Paupers Conveyance (Expenses) Order" of 1898, for example, seems to have been reduced to seven lines in Article 19 of the draft, while the 17 pages of the "Boarding-out Order" of 1911 seem to be contained within the four pages of Part VI. of the draft. There is only one complaint to make. Article 7 of the new code says airily that all rules, Orders, and regulations, whether general or special, heretofore made by the Minister under the law in force from time to time relating to the relief of the poor, so far as not already rescinded, are hereby rescinded (except certain sets of orders and regulations which are expressly saved). This is a slovenly method of legislation, unfair to the public and exasperating to anyone who honestly tries to find out the law. The draftsman knows perfectly well which Orders he is superseding and reproducing in his new document. Why does he not set them out in a list and remove uncertainty by definitely revoking each one?

The draft Order, it will have been understood, seems to involve no change in the law. No medical officer of health or medical practitioner will find himself any the worse. Everyone, in fact, must welcome the clearer and more concise statement on a subject which is so rapidly changing. Already the consolidating Poor Law Act of 1927 is to be replaced by a fresh consolidating Act which has passed through Parliament. It remains nothing less than a scandal that the same process is not applied to the general law of public health and local government based on statutes passed half a century ago. The law is uncertain as well as out of date. Anyone who tries to search out the powers of county borough councils, for instance, has a dismal task ahead of him. It is not well that a department should be the only repository of knowledge in these matters. Let the Ministry of Health carry the process of consolidation further.

ŒSOPHAGEAL OBSTRUCTION IN CHILDREN.

AN anatomical or physiological defect of the œsophagus, serious as it is at all ages, is doubly so in childhood, when it threatens the efficient performance of the functions needed for growth and development, as well as for maintenance of bodily health. Except in such conditions as atresia and congenital stricture, it has long been recognised that there is a possibility of recovery under prolonged and careful treatment, but there has been considerable divergence of opinion on the mode of treatment yielding the best results. It seems likely that the conflicting evidence on this point has been to some extent due to an imperfect classification of the defects encountered, and that a clearer conception of the pathology of these cases will divide them into diverse types, for each of which a different therapeutic technique is indicated.

The work which has been done by J. A. M. Cameron, G. W. Raike, and others has shown that the condition of cardiospasm, or achalasia, is a definite clinical entity dependent on a defect of neuromuscular mechanism, associated with degeneration of Auerbach's plexus in the lower end of the œsophagus. Good results have been obtained in this disorder by the passage of mercury bougies, continued over a long period, as described by A. F. Hurst.[1] The treatment of œsophageal obstruction has, however, been decidedly less satisfactory in small children than in older ones and in adults. A valuable communication by Dr. Wilfrid Sheldon and Dr. A. G. Ogilvie[2] strongly suggests that this may be due to the fact that the obstruction in children is usually occasioned by some factor other than achalasia. These authors have made a careful study of six children observed by them at the Hospital for Sick Children, Great Ormond-street, and of the records of six cases previously treated there. Of these 12 cases, two only showed obstruction at the level of the diaphragm, and they appeared to be cases of congenital stricture. In the remaining ten the obstruction was at the level of the seventh thoracic vertebra, and they appear to form a clinical group with well-defined characteristics. In all the severe cases the vomiting dated from birth or the first few weeks of life; it usually became more severe when solid food was added to the diet. It was possible to observe some of these children at intervals during a number of years, and to compare the radiographic appearances at different ages. The authors are of the opinion that these children did not obtain real benefit from the passage of bougies. In the case-histories of some of them immediate improvement is recorded as following this measure, but it was usually followed by re-admission with recurrence of the symptoms, sometimes in an aggravated form; in no case was a lasting benefit or a cure obtained. The cases in which the greatest improvement—sometimes amounting to cure—was obtained were those which were treated by prolonged restriction to a fluid diet, without the passage of bougies. Only two of these came to autopsy; in one of them the symptoms had been cured at the age of 3½, and death from tuberculosis occurred later, the œsophagus being found to be absolutely normal.

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[1] THE LANCET, 1927, i., 618.

[2] Arch. Dis. Child., 1929, iv., 347.

Sheldon and Ogilvie make some interesting suggestions on the pathology of this type of œsophageal obstruction. They believe that the abnormality is congenital. This conception is supported by a high incidence in premature children and a four-to-one ratio of males to females, as well as by the onset of the symptoms in early infancy. They suggest that a narrowing may take place at the junction of the two segments (retropharyngeal and pre-gastric) of the foregut by the union of which the œsophagus is developed, or that the lower segment may be narrowed as the result of inadequate growth. If suitable conditions can be maintained—the most important being a purely fluid diet—spontaneous cure of the symptoms may be achieved by the growth of the œsophagus to a calibre adequate for the transmission of solids. They have certainly made out a case for regarding the majority of œsophageal defects in children as something different from achalasia, and for giving prolonged trial to this method of treatment.

LIVER IN ANÆMIA.

WITHIN the last four years a great deal has been added to our knowledge of the use of liver in the treatment of anæmia, and Dr. Janet Vaughan[1] finds a general consensus of opinion that it is a certain remedy for those forms associated with a megaloblastic hyperplasia of the bone-marrow. The best known of these is, of course, "pernicious" anæmia, but a good deal of evidence has now accumulated tending to bring under this heading the *anæmia of* sprue and also the type described by Channing, in the 'forties of last century, as the "grave anæmia of pregnancy." It has still to be directly proved whether there is megaloblastic hyperplasia of the bone-marrow in this last type of anæmia, but the condition is characteristically associated with a high colour-index, and this is indirect evidence of such hyperplasia. In all these states there are signs that the therapeutic action of liver is seriously inhibited by sepsis, but this is not to be taken as an indication that sepsis is in any way their cause. It is further generally agreed, says Dr. Vaughan, that liver is useful in the treatment of anæmia secondary to gastric and other hæmorrhage, and that in these conditions its action is enhanced by simultaneous administration of iron. It is also of value in certain of the nutritional anæmias. Whether the principle effective in anæmia of the megaloblastic type is the same as in the others remains uncertain. There is little doubt that in the megaloblastic forms the effective principle is the polypeptide isolated by E. J. Cohn; in the secondary anæmias the inorganic salt content of the liver may be of importance, and this may explain the observation that liver extracts are useless in certain types of anæmia, particularly those with a nutritional basis, which respond well to whole liver. On the evidence to date Dr. Vaughan comes to the conclusion that pernicious anæmia must be regarded as a deficiency disease, having as its basis the absence of some principle normally present in both liver and kidney, without which the bone-marrow cannot produce or liberate its normal quota of red cells. As to the mode of action of the liver, two different views are held. J. Müller believes that pernicious anæmia is due to over-action of the reticulo-endothelial system, resulting in the production of megalocytes at the expense of normal red cells; he thinks that liver acts by inhibiting the megalocytic hyperplasia and giving an opportunity for formation of normal red cells. G. R. Minot believes that the primary deficiency is failure of the red cells to attain maturity and that liver acts by stimulating the cells to complete their growth cycle. His view gains much support from embryology, and bids fair to be established. But even so, the nature of the force causing this abnormality in the growth of the red cells remains obscure.

CLINICAL EFFECTS OF OVARIAN HORMONE.

IN a preliminary communication to the Royal Society of Medicine (Section of Therapeutics and Pharmacology), on Tuesday last, Prof. E. C. Dodds and Dr. J. D. Robertson put the landmark in the history of ovarian hormone research at the time when Allen and Doisy first standardised the material by the vaginal smear method. Characteristic cells appear in the smear during the three stages in the cyclical changes, and Allen and Doisy showed that the injection of extracts made with the use of volatile solvents would cause these changes to reappear. As there is a definite quantitative relationship between the amount of hormone injected and the changes in the vaginal smear the biochemist is now able to estimate the strength of his preparations. This has enabled him to proceed with the purification of the material so that whereas in former years the preparations were in the form of a stiff oil, insoluble in water and with a rat-unit of only 10–15 mg., nowadays it is possible to obtain a water-soluble material containing several hundred rat-units to the milligramme. In this form it can be injected into human beings without causing any of the severe local and general reactions that it produced in the past. When injected subcutaneously œstrin has been known to produce: (1) œstrus in ovariectomised animals, (2) premature puberty in young immature female animals, and (3) abortion of pregnant animals. It does not follow, however, that it will therefore cause menstruation and abortion in women, and it is not fair to expect it to induce processes in human beings which possibly bear only a distant biological relationship to those occurring in the lower animals.

The preparation employed in the clinical experiments related by Prof. Dodds and Dr. Robertson was made by the process already published from the Courtauld Institute of Biochemistry and contained 10 rat-units per c.cm. Since the investigators were quite in the dark on the dosage all the patients received 1 c.cm. per day for two months. It was thought that the best results would be obtained by giving a series of small doses over a considerable period, as it had been shown in animal studies that a better response was evoked by small doses spread over a period of days than by one large dose. The patients injected were cases of amenorrhœa in both married and unmarried women, patients from whom both ovaries had been removed, and attempts at the induction of labour. The following table summarises the results, cases which could not take the full two months' course having not been further analysed.

	Unmarried.		Married.
Cases treated	40	......	38
" having full 2 months course ..	32	......	30
" in whom menstruation started	10	......	18
" feeling better	30	......	29

In the successful cases slight bleeding usually occurred within a week or ten days of the treatment, sometimes amounting to a full period, and this was followed in three or four weeks' time by a perfectly normal period. After two months' treatment the periods continued to appear regularly and the patients all felt much better. This improvement in health, however, as also in the cases when menstruation did not occur, was partly due to psychological causes as excellent tonic effects were observed in many cases receiving normal saline injections who thought they were getting the active preparation. In three attempts at producing premature labour only one was definitely effected and the experiments were abandoned. Five cases of menopause were treated with definite improvement in all.

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[1] Quart. Jour. Med., January, 1930, p. 213.

It will be seen from the summary that only 30 out of nearly 80 cases treated showed objective improvement, and the investigators expressly stated their feeling that the series was too small to form the basis of a valid opinion, and that at least 1000 cases of amenorrhœa should be treated before the material could fairly be assessed. Much larger doses must be given, they thought, particularly in the attempts at producing premature labour, before discarding the substance as useless, but this was impossible at present owing to the expense and labour involved in producing the material. They concluded by pleading for a thorough trial with objective results.

NEW METHODS IN SPINAL ANALGESIA.

Two papers at the Section of Anæsthetics of the Royal Society of Medicine last Friday produced some sound evidence of the value of spinal injections in the present state of knowledge. The first by Mr. Charles Donald gave a judicious and well-balanced account of the value of spinocain, the merits of which have been, as is so often the case with a new method, suffering from over-statement. Mr. Donald showed that in most respects spinocain is neither better nor worse than novocain. It has the advantage of being more slowly absorbed and therefore less toxic, but the extravagant claims made for it as regards exact localisation of analgesic effect and as regards absence of fall of blood pressure, or of subsequent ileus, were shown to be unfounded. In the other paper Dr. Howard Jones trod new ground with the use of large quantities of percain in dilute solution as an intrathecal injection. He stated that his account must only be regarded as a preliminary, but the results he detailed were excellent, and were borne out by the testimony of other speakers. Dr. Howard Jones's method is based on principles determined by the specific gravities of the cerebro-spinal fluid and of the injected liquid, and provide a logical means of affecting the anterior and posterior roots in accordance with the decubitus of the patient, and of localising the upward extension of the analgesia with sufficient accuracy for practical purposes. In upper abdominal work he cannot eliminate vagal effects when the stomach is handled (e.g., retching), but he can produce at will a perfect block of spinal nerve roots up to the second dorsal vertebra. The value of percain lies largely in the extreme dilution in which it is effective and the consequent absence of toxic effects from absorption into the general circulation. The condition of patients with percain is superior to that usual with novocain or stovaine. The after-headache does occur, but this and after-vomiting are certainly not more severe than those not uncommonly met with after the use of the former drugs and may be even less severe.

CONGRESS OF DERMATOLOGY AT COPENHAGEN.

The eighth International Congress of Dermatology and Syphilology is to be held in the Christiansborg Palace at Copenhagen from Monday, August 4th, to Saturday, August 9th, under the patronage of the King of Denmark and the presidency of Prof. C. Rasch. After a meeting of delegates on Monday afternoon and a reception in the evening, the Congress will be opened by the King at 9 A.M. on Tuesday, to be followed by a discussion on the Ætiology and Pathogenesis of Eczema, introduced by Darier (Paris) and Jadassohn (Breslau). On Wednesday morning the subject of Syphilis: Immunity, Reinfection, Superinfection, will be introduced by Truffi (Padua) and Wade Brown (New York). On Thursday morning dermatological cases will be demonstrated at the Rigshospitalet, and on Friday morning a discussion on Tuberculosis of the Skin and its Treatment will be introduced by Adamson (London) and Reyn (Copenhagen). Every afternoon except Thursday individual papers will be read and discussed; intending readers are asked to communicate before April 1st with the Secretary-General of the Congress, Dr. Svend Lomholt, Raadhuspladsen 45, Copenhagen, and to state if any projection apparatus is desired. A maximum of 15 minutes will be allowed for the reading of these papers, of which a short summary in English, French, German or Italian should be sent to the Secretary before June 15th. Foreign members wishing to take part in the Thursday demonstration of cases should apply to Dr. H. Haxthausen, Finsens med. Lysinstitut, before June 30th; accommodation for such patients will be provided gratis for two days in the skin department of the Rigshospitalet. A scientific exhibition will be held during the whole period of the Congress from 9 A.M. to 6 P.M. in the Kongens Ridehus at the Palace, the manager being Mr. C. B. Ingwersen, Danasvej 30, Copenhagen V., to whom applications for participation should be addressed. The Dansk Rejsebureau has undertaken to make arrangements for the accommodation of members of the Congress at very moderate figures and there will be a travel bureau enabling visitors to make tours in Copenhagen and excursions to Bornholm, Jutland, and Odense. The Danish State Railway is offering members of the Congress a reduction of 50 per cent. on their return tickets. The British delegates to the Congress are Dr. H. G. Adamson and Dr. Arthur Whitfield, Dr. A. M. H. Gray being local secretary.

THE ACTS OF RAHERE.

On March 11th a cast of actors, whose names are not announced, gave the first performance of the "Acts of Rahere," a play depicting the foundation of St. Bartholomew's Church and Hospital 800 years ago. Rahere was one of those "fiery particles" which have a lasting hold on the imagination. He was officially the Court jester of Henry I., and attained much influence while still a young man. After religious conversion he went on pilgrimage to Rome, and there during illness had a vision of St. Bartholomew, who told him to build a church and hospital in the Smooth Field, one of the most depressing and useless spots in the neighbourhood of London, a deserted swamp near the public execution ground. He promptly returned to England, discovered that the site he wanted was the King's and boldly asked for it, in spite of Henry's anger at his desertion. He not only gained his point but his Sovereign's interest and practical help, and he soon drew support in money and personal service from a large section of the population of London. This is the drama that the actors of St. Bartholomew's reconstruct every evening at 6 o'clock in aid of the project to build a new surgical wing holding 250 beds and an operation block with six theatres. The stage is the sanctuary of the old church itself beside Rahere's own tomb; the performance, in the candle-lit setting of this perfect Norman fabric, is extremely impressive.

Dr. Norman Scott Carmichael, Physician to the Royal Hospital for Sick Children, Edinburgh, has been appointed Surgeon Apothecary to the King's household at the Palace of Holyroodhouse.

The William Mackenzie Medal for 1929 for original contributions to ophthalmology of outstanding merit has been awarded by the custodians, The Glasgow Eye Infirmary, to Prof. J. van der Hoeve, of Leiden, Holland.

Dr. Carey F. Coombs will deliver the Lumleian Lectures at the Royal College of Physicians of London at 5 P.M. on March 20th, 25th, and 27th. His subject will be Syphilis of the Heart and Great Vessels, and members of the medical profession will be admitted on presentation of their cards.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCC.—THE TREATMENT OF HÆMOPTYSIS.

The Causes of Hæmoptysis.

NEARLY every student when asked the causes of hæmoptysis begins by describing "false hæmoptysis," coming from the teeth, the throat, and the larynx. A modicum of intelligence on the part of the patient and the doctor is sufficient as a rule to determine whether the blood is coughed up or not. If it is in streaks mixed with phlegm it must almost certainly have come from the lung; if it is in larger amounts it must come from the lung. The differential diagnosis between hæmatemesis and hæmoptysis is, of course, important, but not usually difficult, and for reasons of space will not here be discussed. Disastrous errors occur because hæmoptysis is ignored or its cause belittled. Hæmoptysis implies some pathological condition needing investigation. The commonest cause, apart from acute infections such as the pneumonias, is pulmonary tuberculosis. The diagnosis of this depends on symptoms, on bacteriological examination of the sputum and fæces, the temperature record, weight record, physical and X ray examinations. Frequently after a hæmoptysis the doctor, finding no abnormal physical signs in the chest, sends the patient to a laryngologist instead of making further investigations into the state of the lungs. There is practically no condition in the larynx which will produce a hæmoptysis of any appreciable amount. The following example is a not uncommon type of tuberculous hæmoptysis. Yet, in my experience, incredible as it may seem, the hæmorrhage would have been explained by many medical men in some other way; a true diagnosis might never have been made, and the subsequent course would have lent support to whatever false hypothesis had been formulated.

One evening a medical student coughed up over half a pint of blood. He was taking his finals and had appeared to be in normal health. His temperature after the hæmorrhage was slightly raised. His appearance was anxious. There were abnormal signs in the left upper lobe. Some of the clotted blood was taken for examination. Tubercle bacilli were found. In three weeks his temperature was normal, he was putting on weight, the abnormal physical signs had entirely disappeared. The X ray picture, taken within six weeks of the hæmoptysis, was absolutely normal, and repeated examinations of the sputum did not reveal tubercle bacilli again. He went to a sanatorium for a time, returned, became qualified, and has for some years now remained in robust health.

If it were not for the first bacteriological examination in this case the proof positive would have been lacking. Nevertheless, whether tubercle bacilli are found or not these hæmorrhages are almost always of tuberculous origin, except when they are due to something much worse and much rarer—namely, bronchiectasis or malignant growth.

After tuberculosis we come to rarer causes. Other chronic infections must be considered — non-tuberculous fibrosis, bronchiectasis, and such rare conditions as actinomycosis and broncho-pulmonary spirochætosis or spirillosis. There is a type of bronchiectasis, the chief symptom of which is not expectoration but recurrent hæmoptysis, sometimes profuse. Without a lipiodol injection exact and positive diagnosis is impossible. After bronchiectasis come neoplasm, infarct of the lung, and abscess of the lung. Infarction is especially common with mitral stenosis, but may occur with phlebitis of any systemic vein, particularly of the femoral vein. Infarction of the lung may occur before any pain or œdema is obvious in the leg. Hæmoptysis is also possible in intense congestion from back pressure, and possibly from local thrombosis in the lung itself. Other causes are aneurysm, foreign body, certain parasites, such as distoma, &c. Injury, of course, may cause hæmoptysis; not only the obvious bullet wounds, sword thrusts, and bayonet stabs of the text-books, but severe blows and an unrecognised fracture of the ribs and clavicle. High blood pressure may be the cause of hæmoptysis. It may occur in certain blood disorders—purpura, hæmophilia, scurvy, leukæmia. Occasionally one meets with a brisk hæmoptysis in elderly people; after full investigation, and having excluded tuberculosis, new growth, and high blood pressure, all that one can say is that there appears to be an old scarred area. The origin of this may have been an antecedent tuberculous or non-tuberculous infection at some time.

Measures for Relief.

In some cases treatment of the cause may stop the hæmorrhage. For example, the relief of congestive heart failure by venesection, cupping, heart "tonics," and so on, or the proper treatment of scurvy. But these are infrequent causes of hæmoptysis. Unfortunately, we do not know how to prevent infarction, but fruit juice and citrates are worth trying. Hæmoptysis in high blood pressure cases may be severe and cause much distress and anxiety, and be very difficult to control. Venesection may be called for, and here, if anywhere, the vasodilators would seem theoretically to be indicated; the nitrites, trinitrin, erythrol tetranitrate, amyl nitrite, &c., hot mustard foot baths, and such remedies as ipecacuanha and emetine are worth trying. The coagulants to be mentioned later are, of course, theoretically contra-indicated, for fear of producing thrombosis in other parts to which the patient is already predisposed. The largest hæmorrhages come from tuberculous and bronchiectatic cavities, occasionally from growths and from rupture of an aortic aneurysm. For the last mentioned very little can be done beyond rest and the giving of some form of opium to allay restlessness. It is chiefly the hæmorrhages from tuberculosis or bronchiectasis that we shall be called upon to treat. The number of remedies is legion. Bleeding tends to cease spontaneously. For this reason many remedies have gained an undeserved reputation.

A sudden hæmorrhage may occur without any warning. The patient is terrified. The first thing, therefore, is to try to allay anxiety by giving a small injection of morphia, just enough to calm the patient but not sufficient to suppress in the least the cough reflex. If care be not taken in this respect there is a great danger of blood being aspirated into other bronchi and flooding the whole lung with blood, thus setting up a pneumonic condition. Some give codeine, gr. 1/7th (though why 1/7th, except to confuse the student, I do not know), two or three times in the day, instead of morphine. The patient must be so arranged that he can get rid of the blood from his mouth with the least possible exertion. An ice pack on the chest is comforting for the patient, and the relations, and if it does no good it does no harm. The position should be a comfortable one. Let there be no hard-and-fast rule. A semi-sitting posture may be the best. Rigid insistence on absolute rest in the flat position is absurd.

If the bleeding continues one or more of the following remedies may be employed. The action of none of them can be guaranteed, but no apology is made for the length of the list because we must do something, and from the urge within us to do this something, and for the sake of the patient, and the relatives, it is of great help to have several remedies at our disposal. An old simple device and one that may be effective is half a teaspoonful of common *salt* in water, given by mouth. Salt may also be given intravenously, 5 c.cm. of a 10 per cent. solution. Gravesen recommends *calcium chloride* 20 c.cm. of a 15 per cent. solution, given intravenously slowly and with great care not to get it into the tissues as it is corrosive. An injection of *hæmoplastin* may be given. The objection to this, however, is the possibility of an irritating rash or serum sickness. This, when it occurs, may be controlled by adrenalin, but adrenalin given hypodermically has been condemned in hæmoptysis. *Coagulen-ciba*, 5 c.cm. may be given hypodermically. This is said to contain bovine blood-platelets and not to cause serum reactions. A. J. Morland, however, reports a case where the patient, after an injection, experienced a sensation of lumps all over his body and these would appear to have been of an urticarial nature. This same author has injected coagulen-ciba 5 c.cm. and 10 c.cm. directly into a cavity in a case of severe, recurrent, and dangerous hæmorrhage, apparently with dramatic effect, and this is well worth trying in serious cases where there is a large cavity in a known position, or even as a hazard, if things are desperate. Two other substances which claim to increase the coagulability of the blood may be mentioned: *thromboplastin* and *fibrogen*. They must be used subcutaneously or by mouth, or both, but not intravenously. *Ergot* has been extolled by certain optimistic clinicians, but on pharmacological grounds should do more harm than good. *Emetine* in gr. ¼ doses, given hypodermically three or four times in a day, is worth trying. *Amyl-nitrite* inhaled is both extolled and condemned. It has the support of many clinicians. The same applies to *nitroglycerin* in 2 to 4 minim doses. *Oil of turpentine*, minims 20, in an emulsion every four hours, is a time-honoured remedy which does no harm. *Adrenalin* cannot be justified on experimental grounds. Given intratracheally, however, by the oral route, over the back of the tongue, as one gives an oral lipiodol injection, it is said to be most effective. This is perhaps true, but the obvious objection is the impossibility of doing it in an emergency when blood is welling up into the mouth. In a calm interval, however, it might be worth trying. *Binding the limbs*, but not for too long a period, may tide the patient over a critical period. Even *blood transfusion* may have to be considered.

Artificial Pneumothorax.

If none of these things acts, and matters are becoming urgent, there is only one method that is likely to be effective and that is the production of an artificial pneumothorax. In hospital where the apparatus is available it should not be used only as a desperate resort. If it were known from which side the blood was coming it would be used early, but it is not always possible to determine this. Even so, it would be better to induce a partial bilateral pneumothorax than to do nothing. The time is long overdue when every practitioner of medicine should know the inestimable value of such induction. If the affected lung can be compressed by this procedure, all bleeding is stopped and its recurrence absolutely prevented.

For recurrent small hæmorrhages, whether from tuberculosis or bronchiectasis, if the disease is unilateral, some form of collapse therapy is the best. First and foremost comes artificial pneumothorax. This is simple, painless, and safe. If not hindered by adhesions, it will stop hæmorrhage and it will promote healing. There is no point in delaying this treatment, for everything is to be gained by it. If, because of adhesions, an artificial pneumothorax cannot be obtained, phrenic evulsion and thoracoplasty may have to be considered. Apart from these measures the patient must avoid strains, excitement, and alcohol. Yet, not infrequently, hæmorrhage will occur when the patient is at complete rest. Calcium may be given, for example, calcium chloride grs. x., calcium lactate grs. x., three times a day, and this, I believe, to be of great help. In conclusion, the fear inspired by a big hæmoptysis must not be forgotten. Our efforts to control a hæmorrhage must never subject the patient to further risk; insistence on the prone position, for example, may cause great suffering and almost choke the patient, and, moreover, make it difficult for him to eject the blood. An overdose of morphia may be disastrous by promoting aspiration, while injections of serum may produce intolerable urticaria. While one should never remain passive and inactive in these cases, a fussy interference may do more harm than good. The injection or application of one of the above-mentioned remedies at regular intervals undoubtedly gratifies both the patient and the relations. The best way to treat a hæmoptysis is to prevent it. This may be impossible, as hæmoptysis is sometimes the first symptom. When there is a known focus from which a recurrent hæmorrhage is arising, artificial pneumothorax treatment should be attempted without delay in some cases, even if the disease is bilateral.

F. G. CHANDLER, M.D. Camb.,
F.R.C.P. Lond.,
Physician, City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.

Special Articles.

STUDIES OF VIRUS DISEASES.

THE MEDICAL RESEARCH COUNCIL'S SURVEY OF THE POSITION.

No part of the work directly promoted by the Medical Research Council has greater biological interest at the present time, or more vital practical importance for the cure and prevention of disease, than the inquiries now being made into various diseases in animals and man caused by the so-called "viruses." These inquiries are concerned with an invisible underworld of bodies that in size stand somewhere between the largest known molecules of dead organic matter and the smallest microscopic bacteria. These cannot be seen as definite structures by ordinary microscopic means, and the relation to them of certain objects made visible by special optical methods is still a matter of discussion. They are called "filter-passing" because many of them will traverse a filter fine enough to hold back and strain off ordinary bacteria from a fluid containing them.

Whether these "viruses" are organised as minute, ultra-microscopic bodies is still an open question; in any case, they are presumably too small to have an organisation similar to that of such cells as have hitherto been regarded as primary units of living matter. Nobody has yet succeeded in preparing an artificial fluid which will, by itself, provide conditions in which these viruses will reproduce themselves and multiply; some of them, however, will grow in artificial conditions if a piece of surviving tissue, taken from a freshly killed animal, is added to a suitable medium. It seems to be characteristic of a virus that it can multiply only in the presence of living cells which it can infect.

When the virus causing any disease is introduced into the animal, or the plant, in minute quantity, there may occur a rapid, unseen, and unexplained multiplication of it throughout all the parts of the organism attacked, since a minute portion of any of those parts will be found able to infect another similar organism.

TWO CONVERGING LINES OF EFFORT.

Those now working with viruses are under difficulties very like those that confronted bacteriologists two generations ago, before they had found adequate methods of microscopic study and of artificial cultivation. At present their endeavours may be thought of as following two converging lines of effort: (1) practical devices are sought by which empirical imitations may be made of the immunity to a second attack of a virus disease that most commonly follows recovery from the first attack under natural conditions; (2) investigation is made by every known method into the physical properties and natural history of the virus itself.

Attempts to Produce Immunity.

The particular historical method of using cow-pox as Jenner did to immunise against small-pox in man has not so far been found applicable to other virus diseases. Small-pox adapted to living in the tissues

MEDICAL SOCIETY OF LONDON.

ANNIVERSARY DINNER.

THE 157th anniversary dinner of the Medical Society was held on March 6th at the Hotel Cecil, the President, Mr. Donald Armour, presiding. The guests included the President of the Royal College of Physicians of London, the Master of the Society of Apothecaries, the Regius Professors of Medicine at Oxford and Cambridge, the Directors-General of the Navy, Army, and Air Force, the President of the British Medical Association, Mr. Lucian Pacaud (High Commissioner for Canada), Colonel J. L. Ralston (Minister of National Defence for the Dominion), Mr. W. C. Noxon (Agent-General for Ontario), Mr. Wilson Cross (President of the American Society in London), the Presidents of the Royal Society of Tropical Medicine and Hygiene, Harveian Society, Medico-Legal Society, Hunterian Society, West London Medico-Chirurgical Society, and Chelsea Clinical Society, the chairmen of the National Hospital, Queen-square, and the West London Hospital, Sir Lindsey Smith, and the Editors of *Canada*, the *British Medical Journal*, and *The Lancet*.

Sir Humphry Rolleston proposed the toast of the Medical Society of London. A good wine, he said, needs no advertisement, and the Medical Society admirably illustrates the law of the survival of the fittest, for, when founded in 1773 for 30 physicians, 30 surgeons, and 30 apothecaries or general practitioners, there were quite a number of other medical (or *physical*) societies, while it is now the only one left. It is the oldest medical society in London with the solitary exception of the Guy's Physical Society, and it is interesting to note, as showing that Guy's men are very clubbable men, that in Medley's picture of the 22 Founders of the Medical Society a quarter are Guy's men. Among the virtues of the Society is celibacy—though not for want of offers to join up nearly a quarter of a century ago with the Royal Society of Medicine—and its stern virtue no doubt played part in its contrary decision. Medley's portrait also shows another tradition of the Society now fallen into desuetude, and the President will perhaps explain why that high officer no longer wears his hat at all meetings. The Society is now in its 157th year, and has recently flourished in a remarkable degree, increased mightily in its members, and more than lives up to its high traditions, results due to the devotion of its officers. With its chief officer, Mr. Donald Armour, this toast is coupled. He is a great surgeon, exploring the brain with high intent or laying bare the misdeeds of the spinal cord—he was indeed the first Lettsomian lecturer to take that region of surgery as his subject.

Mr. Donald Armour, in reply, said that in thanking the proposer of the toast, who, himself, had once occupied the Presidential chair of the Society, for his flattering references, he would be brief in deference to the Society's rules. When that altruistic Quaker, he continued, John Coakley Lettsom, founded the Society, he said of its utilitarian objects: "Nothing has contributed more to the advancement of science than the establishment of literary societies; these excite a generous ardour in liberal minds, and raise even envy itself into useful emulation." Having launched the Society, it was necessary to provide it with rules and regulations. Judging from the numerous and protracted meetings held for this purpose, it was obvious that there were differences of view, but Lettsom, whom his biographer, Pettigrew, has described as "the uniform pacificator of all differences . . . rarely failing in effecting an adjustment of them," lived up to his reputation, and order finally came out of confusion; but it is significant, as proving the length and warmth of these discussions, that the first scientific paper read before the Society by its first President, Dr. John Millar, was entitled, "Observations on the Loss of the Voice." Having settled their differences and recovered their voices, the Society settled down to pursue its vocation in peace until, in 1786, an Irishman, one Dr. James Sims, was elected President. He is described as "a good-humoured, pleasant man, full of anecdote, an ample reservoir of good things, and for facts and figures a perfect chronicle of other times." In transatlantic parlance this Irishman must have been a "good mixer." At any rate, he mixed the ballot box so successfully that he occupied the Presidential chair for 22 consecutive years. Being an Irishman, his was at first probably a beneficent despotism. But later, when it became an autocracy, the inevitable happened—revolution, fortunately, a bloodless one. Some of the younger Fellows, despairing of the retirement or demise of this Irish dictator, broke away, and in 1805 founded the Royal Medical and Chirurgical Society, the nucleus of the Royal Society of Medicine. Having purged itself of malcontents, the Medical Society of London has continued ever since along peaceful lines, growing yearly in strength and stature, and always adhering to the purposes of its foundation, as laid down by Lettsom himself—namely, "to give the practitioners in the healing art frequent opportunities of meeting together, and conferring with each other concerning any difficult or uncommon cases which may have occurred; or communicating any new discovery in medicine, which has been made, either at home or abroad." And we still pride ourselves upon what I may call, professionally speaking, the cosmopolitan character of our meetings. Unlike our rebel offspring, now grown to Gargantuan proportions, we are not "sectionists," we do not work in water-tight compartments, we do not encourage specialism as such, our discussions are not limited to any part of the human body, to any age, nor to either sex. In this Society we have a small and jealously guarded list of Honorary Fellows, and we have made a single addition to it this year, the first in three years. I refer to Sir Arthur Keith, just now absent in Egypt; we are anticipating with the greatest pleasure his oration before the Society in May on "Modern Medicine and Evolution." I conclude my remarks with a confession, which is in no sense an appeal; but I hope that it will be an appealing confession. In our home we have a Cinderella, waiting these many years for the clothing that her beauty and her rarity deserve. In hopeful expectancy we anticipate the coming of some fairy godfather, or godmother, or both, who will provide her with proper coverings to preserve her for all time. I refer to some of the priceless contents of our library. They comprise thirteenth century manuscripts and printed books dating from 1471. I should like to start a "free-trade" crusade—free trade between the lovers of books, who have money to spare, and our library that needs it for the care of our valuable books and manuscripts. Thus our Cinderella might have her fairy slippers, and the Fellows of the Medical Society live happily ever after.

The toast of the Guests was proposed by Dr. Eustace M. Callender, also a past-president of the Society, who referred to the high position occupied by many of their guests, and who coupled the toast with the name of Colonel Ralston, whose great abilities as legislator and lawyer, he said, were now recognised as his qualities as soldier had been recognised throughout the recent war. Colonel Ralston, in his reply, referred to the presence of Canadian guests as due to the long and high association of the President's family with the Dominion, and showed that a sound legislator and a brave soldier could be also a witty man.

CITY OF LONDON MATERNITY HOSPITAL.—A series of post-graduate lectures will be given at this hospital at 5 P.M. on Tuesdays from March 25th to June 10th. The lecturers will be Dr. Abernethy Willett, Mr. R. Christie-Brown, Mr. McKim McCullagh, Mr. Arnold Walker, Mr. Harold Burt-White, Dr. Sydney Owen, and Dr. H. C. Lucey.

Correspondence.

"Audi alteram partem."

VARIOLA MAJOR AND MINOR.

To the Editor of THE LANCET.

SIR,—I have read with much appreciation the paper by Dr. R. W. Jameson, appearing in your issue for March 8th. I wish strongly to support his contention that the time has come when the distinction between the two forms of small-pox, major and minor, should be officially recognised. As he points out, whilst it may not be easy to decide the nature of the first case in an outbreak it should always be possible to decide after a series of cases have occurred. I believe that no real doubt exists about the nature of any outbreak which has occurred in this country since the war, and it is only in the post-war period that the existence of variola minor as a distinct form of small-pox has been suspected. Dr. Jameson draws attention to the confusion and other disadvantages resulting from the present plan of calling both forms "small-pox," without distinction. We may well ask what value our present case-mortality statistics will have in years to come when it will be impossible to know what proportion of the cases lumped together as "small-pox" were of the major or minor variety respectively. The terms "variola major" and "variola minor" have, as Dr. Jameson states, been accepted in the last Decennial International Conference on the Nomenclature of Causes of Death, and I venture to suggest that the Ministry of Health would be moving in the right direction if they invited medical officers of health in reporting small-pox cases to specify whether the cases were major or minor.

I am, Sir, yours faithfully,

C. KILLICK MILLARD,
Medical Officer of Health.

Health Offices, Leicester, March 11th, 1930.

PROTECTION AGAINST MEASLES.

To the Editor of THE LANCET.

SIR,—Your interesting leading article last week is a valuable contribution in the study of immunity, but raises one or two practical considerations in relation to private practice. "The importance of this work," you say, "lies in the fact that it brings the sero-prophylaxis of measles within the range of measures practicable to the family doctor, for one or other of the parents is almost certain to have had measles, and thus the donor is immediately available." That is to say, we are now considering the individual child or family.

That a parent's serum may still carry the immunising properties is so convenient that the procedure should be quite simple. But it is an important consideration how long any such passive immunity may last; because measles is a very harmless disease in small children, when efficiently treated—that is to say, in bed, in a room that is really warm, with a minimum of washing—whereas in young adults it tends to be much more serious, and most of us know of fatal cases. I believe that the most experienced medical officers of public schools are afraid of the boys who have not already had measles. I believe the evidence that measles should be treated at home during childhood, rather than at school or in lodgings or hospital later on, is so convincing that prophylactic inoculation against measles, producing a short-lived passive immunity, is a doubtful advantage for young children, who might otherwise have developed an active immunity by having measles at home with no disadvantage other than the loss of a few Christmas parties or some day-school lessons.

A short-lived passive immunity might be of the utmost importance in exceptional circumstances—for example, shortly before a scholarship examination or a family holiday—but for the latter the possibility of only obtaining an "attenuated measles after a long incubation period" might make the dates more inconvenient. A fellow student of mine, some 30 years ago, developed measles at an awkward time in his medical curriculum, and his father, who was a doctor, told me he would deliberately expose his children to the infection of such illnesses, if he could have his time over again. Without going as far as this, if I were advising the medical profession with regard to their own children, I should say that the first time a child is exposed to the infection of measles is probably the most convenient and the safest time to have the disease. To prevent that attack, with a short-lived immunity, leaves an added responsibility for the future, and should only be attempted when some exceptional circumstances make measles particularly unfortunate at that season.

When a child develops measles in a hospital ward sero-prophylaxis would be invaluable for the other children, because the administrative responsibilities of measles in a children's ward are very serious.

I am, Sir, yours faithfully,

Derby, March 10th, 1930. HUGH BARBER.

SOCIAL CUSTOMS AND INFANT MORTALITY.

To the Editor of THE LANCET.

SIR,—Indian obstetrical methods and social usages have come in for severe and entirely unmerited criticisms in THE LANCET in a note on a contribution to the *Hibbert Journal* by Miss Eleanor Rathbone entitled "Has Katherine Mayo Slandered Mother India?" Miss Mayo's book having received previously a favourable notice in the same paper. We did not take these uninformed and biased criticisms seriously, but now they have begun to colour all official and unofficial health reports.

The constructive suggestions made in THE LANCET about the education of women and the training of the indigenous *dai* are valuable, if by education is meant real education; but it seems almost incredible that THE LANCET, while discussing the death-rate of Indian infants, should have sedulously omitted all reference to the appalling economic conditions, and trotted out Indian social customs as the sole cause of the high Indian death-rate. That social customs, good, bad, or indifferent, have comparatively little effect on the health of the people and that proper nourishment is the all-engrossing factor, form an obvious proposition. In 1925 the Mississipi inundated a large tract of country and the Government of America pressed into service a flotilla of aeroplanes and dropped tinned provisions to the sufferers. A serious development of pellagra occurred, not as a result of starvation but due to lack of vitamin B in the diet during the short period of relief. Who argues that this absence of stamina on the part of the American people was to be ascribed to their social customs? Also who has ever heard in India of the occurrence of a single flood leaving the people in the grip of pellagra? Judged by this incident Indians have the greater stamina, so that, if social customs are the dominant factor, American social customs make a poor show by comparison. Again, during the great European war the central States of Europe were compelled to go without some only of the essential foodstuffs for not even four years. This short course of restricted diet broke down the constitution of the populations so completely that for years afterwards Vienna, for example, showed an immense rise in the occurrence of rickets and tuberculosis. If this is to be laid at the door of social customs the sooner European social customs are improved the better. The people of India have, with their social customs, been inured to hardships and privations of every sort, and from their cradle been faced with famine and flood.

I undertook last year a private census of 800 births amongst persons with an average income of L.200 a year, all of whom adhered to traditional obstetric methods and the infamous *dai*. The deaths numbered 28·75 per 1000, whereas the general death-rate in England among infants is 70 per 1000. My private figures are corroborated by an official investigation undertaken at the instance of the Director of Public Health, Madras (*Indian Medical Gazette*, October, 1929). In four cities of the Madras Presidency (Madras, Madura, Coimbatore, and Trichinopoly), taking an unselected population of 183,000 (predominantly Hindu), there were over 7300 births in all. It was found that the death-rate of infants varied inversely with the income. Thus in families with incomes of Rs.25 or less, the death-rate was 120 per 1000. In those with incomes between Rs.25 and Rs.50 it lessened to 105 per 1000, while in families with incomes above Rs.50 per month (corresponding to the magnificent sum of £3 17*s.* per month) the death-rate dwindled down to 84 per 1000—i.e., only two-thirds of the normal death-rate in the case of the poverty-stricken and half-fed masses.

The results of the Madras investigation are entirely in keeping with those of the private inquiry held by me, and, if figures can prove anything, they establish beyond the possibility of a doubt that the stomach alone controls the mortality of infants, and that all the other factors combined count but as a feather in the balance. It passes all sober comprehension how anyone, least of all a medical man, professing to talk about the causes of a high death-rate of suckling infants and their mothers, can talk only of deficient medical aid and unhygienic social customs, oblivious of the abject and crushing poverty, of the meagre and poor dietary, leading to chronic malnutrition, verging on to starvation, and of the recurrent horrors of widespread famines and ravaging floods, accentuated by the no less fell ravages of that scourge, malaria.

Perhaps it is not too much to hope that, in a scientific paper of the standing of THE LANCET, the issue here raised will be met squarely.

I am, Sir, yours faithfully,

NALINI RANJAN SEN GUPTA, M.D.

Feb. 15th, 1930.

*** From Dr. Sen Gupta's communication we have only been able to find space for the relevant paragraphs, which correct, as he believes, the faulty impression given by the editorial article in THE LANCET.—ED. L.

SPINAL ANÆSTHESIA.

To the Editor of THE LANCET.

SIR,—I have followed the recent correspondence with interest and with such understanding as the very involved communications allowed. The recent paper on high spinal anæsthesia by Koster and Kasman is startling in its simplicity, and if their results are confirmed, the position should be freed from much of its present obscurity. In the meantime, whatever may be the effect of anæsthetic solutions on the respiratory centre, it is no longer possible to regard paralysis of the diaphragm as a cause of death. I have under my care a patient whose diaphragm is completely paralysed as a result of bilateral phrenic evulsion and whose respiration is in no way embarrassed. Similar results have been recorded by continental surgeons, and the case is recorded merely because it seems to call for some measure of revision of the current theories of respiration.

I am, Sir, yours faithfully,

Omdurman, Feb. 22nd, 1930. L. O'SHAUGHNESSY.

FOOD OR DRUG?

To the Editor of THE LANCET.

SIR,—It is indeed disappointing to find THE LANCET ranged on the side of a bureaucracy which is interfering, I submit unwarrantably, with the professional freedom of practising doctors. The narrative of "one of the four offenders," as set out in your last issue surely reveals a very disquieting state of affairs. I think the inference is inevitable, that these prosecutions for excessive prescribing are largely the result of the arrangement made in 1927 by the then Minister of Health with the dispensing pharmacists. Prior to that date the Drug Fund had always been overdrawn, the natural consequence of its essential inadequacy, but the overdraft had been to some measure met by discounting the bills for dispensing presented by pharmacists on the panel. This very unfair treatment of the pharmacists was remedied by the agreement of 1927, and the pharmacists' fees for dispensing are now a first cost upon the Fund. But there is now actually less money to be spent upon drugs than before and it has become increasingly impossible any longer to camouflage the inherent bankruptcy of the National Health Insurance Fund.

There is a very pertinent observation upon this kind of treatment of panel doctors under the National Health Insurance Acts in Lord Hewart's recent book "The New Despotism" (p. 50). He writes, "'Excessive prescribing,' an offence wholly unknown to the law, which consists in prescribing for the patient medicines that are either too expensive in quality or too liberal in quantity, is one of the things for which a doctor may be penalised. One might think that, for a person who is bound by law to insure and pay contributions under the Acts, the best medicine ought to be prescribed in illness. But apparently that is not always the view of the department. One might wonder whether, in this matter, the interests of the patients are adequately taken into consideration."

You write in your annotation of March 1st, "Those who administer the Acts are agreed that insured persons should get as good treatment as do private patients," but this statement seems to conflict with another sentence in the same leader: "The referees held that the wholesale administration of cod-liver oil *in insurance practice* (the italics are mine) was only legitimate as an experiment, conducted under experimental conditions." This dictum is rather cryptic, but it expressly makes a distinction between insurance and other practice.

I may say that I have asked a question in the House upon this case and have had a personal talk with the Minister of Health, who, while not committing himself in any way, has shown an attitude of sympathy contrasting favourably with the curious aloofness, not to say hostility, displayed by the official medical journals to the practitioner thus penalised.

I am, Sir, yours faithfully,

E. GRAHAM LITTLE.

House of Commons, March 11th, 1930.

*** As a reference to our Parliamentary Intelligence will show, the power to withhold remuneration from insurance doctors on account of excessive prescribing has been exercised by the Ministry of Health since medical benefit first came into operation in 1913. This power in the Minister's view involves no limitation of the scope of medical benefit. Whether or no the practitioner accepts this dictum he must realise that he can only draw more than his share of a limited fund at the expense of the patients of neighbouring practitioners. A correspondent last week convicted us of a regrettable slip in our statement of the composition of the tribunal. Unlike the committee which inquires into complaints against a practitioner, there is no requirement that the referees in these prescribing inquiries should include a barrister or solicitor. The two requirements are that they shall not exceed three in number, and that they shall not include an officer or officers of the Ministry. The same correspondent last week made the point that the referees are appointed by the Minister and are therefore not independent. This has, of course, applied from the commencement of medical benefit to all bodies set up for quasi-judicial purposes under the N.H.I. Regulations, including the most serious case of all, that of removal from the medical list, and there has been no evidence hitherto that insurance practitioners generally regard it as unsound. While the regulation leaves the door open for the appointment as referees of laymen, it has been the practice so far to rely entirely on doctors, in view of the essentially medical nature of the question to be determined. The chairman of the committee of referees has always been a chairman of a panel committee who is known to have paid special attention to this subject; wherever possible the second referee has been a consulting physician with similar experience, and the third has always been a member of a panel committee.—ED. L.

REST IN THE TREATMENT OF GONORRHŒA.

To the Editor of THE LANCET.

SIR,—In reply to Dr. Priest, the point I wished to make was this. No longer should a doctor, when undertaking to treat a case of acute gonorrhœa, acquiesce without strong protest in foregoing his demand of absolute rest on the patient's part. It should be emphatically pointed out to the victim that refusing this, a most essential factor for obtaining an early and successful result, he was laying himself open to, and must take the responsibility for, any serious complication which was more than likely to ensue as a result of that refusal. Too often in the past this all-important demand and explanation has not been stressed, the patient's natural objection to lying-up being taken for granted, with the ultimate result that the doctor receives no recognition of his well-meant leniency, but on the contrary a discontented patient retails and details a long and disparaging story of the treatment received to a "second opinion."

I am, Sir, yours faithfully,
JAMES B. BYLES.

St. James's-place, S.W., March 4th, 1930.

TECHNIQUE OF TRANSFUSION.

To the Editor of THE LANCET.

SIR,—As a therapeutic agent the practice of blood transfusions has very greatly increased of late years. There can be no question but that it is of immense value and in some cases a transfusion may be repeated several times, and by whatever method it is done the mere prick of the needle gives no discomfort to the patient. The practice of introducing the needle into any type of vein can be easily acquired with a little practice; yet it is an extraordinary fact that the old method of dissecting out the vein is still being used. It wastes time, causes some discomfort to the patient, leaves a scar, and the disadvantage increases when several transfusions must be given. I have never yet seen a vein, provided sufficient time and trouble are taken to work it up, when it was necessary to dissect it out. It is surely time that this old and obsolete method should be given up.

I am, Sir, yours faithfully,
H. M. M. WOODWARD.

Harley-street, W., March 1st, 1930.

TAMWORTH HOSPITAL CONTRIBUTORY SCHEME.—Tamworth Hospital, which has had its own contributory scheme, has been compelled by financial considerations to join the big Birmingham scheme. Last year Tamworth raised £3617 in weekly pence, but so many contributors were in hospital for operations or were in-patients of the Birmingham hospitals, whose treatment had to be paid for by the scheme, that there was a loss on the year's working of £374. Birmingham thus received £2284 which left an insufficient balance upon which to run the hospital. In future, Birmingham will pay £3 a week for any patient it sends to Tamworth Hospital, the latter defraying medical and surgical fees.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. J. H. McDowall is placed on the Retd. List with the rank of Surg. Capt.

Surg. Lt.-Comdr. J. R. Brennan to be Surg. Comdr.

Surg. Lt. R. R. Baker to be Surg. Lt.-Comdr.

The following appointments are made: Surg. Lt.-Comdrs. R. W. Mussen to *Pembroke*, for R.N. Hospital, Chatham, and as bacteriological specialist, and H. Brown to *Pembroke*, for R.N. Barracks, Chatham; Surg. Lts. W. P. E. McIntyre to *Effingham* (on recommg.), L. P. Spero to *Vernon*, and D. C. Drake to *Godetia*.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Sub-Lt. S. B. Levy to be Surg. Sub-Lt.

ROYAL ARMY MEDICAL CORPS.

Lt. G. L. Grieve is placed on the half-pay list on account of ill-health.

Lts. J. F. Wilde and W. A. Kerr (temp. commns.) to be Capts.

J. C. Macfarlane to be Lt. (on prob.).

TERRITORIAL FORCE.

Lts. R. Pollok and W. R. Ward to be Capts.

To be Lts.: G. A. F. Holloway (late Offr. Cadet, Univ. of Lond. Contgt., Sen. Div., O.T.C.), D. N. Nicholson (late Cadet, Edinburgh Academy Contgt., Jun. Div., O.T.C.), and P. J. May.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capt. J. Kerr to be Capt.

ROYAL AIR FORCE.

The undermentioned Flight Lieutenants are granted permanent commissions in this rank: A. L. St. Aubyn McClosky, J. M. Ritchie, and B. B. Kennedy.

Air Vice-Marshal David Munro, Honorary Surgeon to the King, is placed on the retired list at his own request.

Flight Lt. J. R. Williams (Temp. Capt., General List, Army, Dental Surgeon), relinquishes his temporary commission in the R.A.F. on completion of service.

INDIAN MEDICAL SERVICE.

Capt. A. Ba Thaw to be Maj.

Lts. W. J. L. Neal (prov.) and B. Shanker to be Capts.

Lt. (on prob.) V. T. J. Lynch relinquishes his prob. appointment.

COLONIAL MEDICAL SERVICES.

Promotions and Transfers: Dr. P. S. Selwyn-Clarke, Chief Health Officer, Federated Malay States; Capt. A. V. Greaves, Bacteriologist, Hong-Kong; and Dr. B. M. Johns, Professor, Clinical Surgery in the College of Medicine, Singapore.

The following new appointments have been made: Dr. W. C. O. Hill, Professor of Anatomy, Medical College, Ceylon; Dr. F. W. Gilbert, M.O., Northern Rhodesia; Dr. E. N. O'Neill, M.O., West African Medical Staff, Sierra Leone; Dr. D. R. McPherson and Dr. H. B. C. Wallace, M.O.'s, Straits Settlements.

DEATHS IN THE SERVICES.

Lieut.-Colonel George Hart Desmond Gimlette, C.I.E., late I.M.S., died at Southsea on March 7th, aged 74. He was the son of the late Fleet-Surgeon Hart Gimlette, R.N., and qualified with the M.R.C.S. Eng. and L.S.A. in 1877. Two years later he graduated M.D., M.Ch. at the Royal University of Ireland and joined the Indian Medical Service. In 1882 he took part in the Egyptian campaign and was present at the engagements of Tel-el-Kebir and Zagazig (medal with clasp and the bronze star). Till the autumn of 1883 he was employed in Egypt on special cholera work and afterwards went to Khatmandu as Residency Surgeon and ex-officio Assistant Resident. In 1891 he became Agency Surgeon in Baghelkhand, and subsequently he went to Indore in the same capacity. From 1901, when he was made a C.I.E., to 1908 he was at the Hyderabad Residency. He retired in 1910, but during the late war he served as P.M.O. of H.M. hospital ship *Sicilia*, and in France, Egypt, and Gallipoli. In 1917 he was re-employed in the I.M.S. as Residency Surgeon, Mysore, but afterwards returned to military duty in Mesopotamia.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

THE MENTAL TREATMENT BILL.

ON Thursday March 6th, the Mental Treatment Bill was further considered by Standing Committee A of the House of Commons. Mr. CECIL WILSON was in the chair.

Boarders "Incapable of Volition."

On Clause 2 (notice of reception, death, and departure of voluntary boarders, and provisions as to boarders who become incapable of volition).

The debate was resumed on the amendment moved at the previous sitting of the Committee by Sir Boyd Merriman to leave out the word "volition" in Subsection (3) and to insert instead thereof the words "voluntarily submitting himself to treatment."

Sir BOYD MERRIMAN said that the Minister of Health had now put down on the Paper a series of amendments which really met the point which he (Sir Boyd Merriman) was trying to raise, but in a slightly different way. The Minister was suggesting the words "expressing himself *as willing or unwilling to continue to receive treatment.*" The doctor would have to express himself in terms that he found the patient incapable of expressing his willingness and that would be the test. He (Sir Boyd Merriman) saw no objection to the form of words, but he would like to make this qualification, which applied to either form of words, that it might be necessary to make it quite clear that this incapacity was due to mental disorder. That point might, however, be left over for further consideration on the Report stage.

Mr. GREENWOOD (Minister of Health) said that he gathered that the Committee would be willing to accept his alternative form of words which were almost precisely those which would have been used in the definition had they defined the term "incapable of volition" later in the Bill. The words had been carefully considered in the light both of the medical and the legal issues involved. He would certainly look into the qualification mentioned by Sir B. Merriman.

Sir BOYD MERRIMAN withdrew his amendment.

Mr. GREENWOOD moved his alternative form of words, which were agreed to.

The "Ins" and "Outs."

Lieut.-Col. FREMANTLE moved in Subsection (3) to leave out the words "one month" and to insert the words "six months." He said that this was to meet the case of the patient, who, coming in as a voluntary patient, lost volition. As the Bill stood it recognised that there might be a chance of matters changing within a month, and consequently that period was given for the patient to change his condition without having to be certified or discharged. Medical experience showed that one month was not long enough for this purpose. That was the deliberate view of the medical superintendents and was also the experience of the London County Council. He would, therefore, ask the Minister if it would not be possible to enlarge the period to six months so as to give the cases which were medically described as the "ins and outs" a chance.

Mr. GREENWOOD said that it was a very serious thing where a person had gone voluntarily into an institution, and then later if he became incapable of expressing himself as to whether he wanted to go on being treated there or not, to detain him for a long period. He thought in view of Clause 5, where treatment would be available without certification, the Committee would be well-advised to let the period of one month stand, because he would be sorry if the question of the liberty of the subject were to be raised again.

Dr. HASTINGS said that the matter did not seem quite clear as the Minister had left it, because in the cases described by Col. Fremantle it would be very difficult to imagine that the mental condition of the individual could be truly explained by saying that he was incapable of expressing himself as willing or unwilling to continue to receive treatment. In other words, there would be a great many cases which could be dealt with by Clause 5 if those words were accepted. The cases which, after being admitted to the hospital voluntarily, became definitely though temporarily insane, and were very clearly able to express themselves as being unwilling to continue to receive treatment, could not, it seemed to him, come under Clause 5. As the Bill stood at present, with the new wording which the Minister had put into it, cases which became temporarily insane and desired to get out had to be certified after a month. He could conceive many people suffering from temporary insanity which one felt quite sure would come right, yet who were far from being able to express themselves as willing or unwilling to continue to receive treatment.

Sir BOYD MERRIMAN said he believed there was a quite simple explanation of the difficulty. They had to bear in mind all through, that assuming every case was a case of mental disorder, if through that disorder a man definitely refused to be treated he was to be certified. There was no escape from that. They were discussing here the length of time during which a man might be detained after he had become incapable of voluntarily continuing his treatment. If steps were taken to keep him under treatment he must be dealt with under Clause 5, or by certification. He agreed with the Minister that they must stick to the period of one month in order not to raise the question of the liberty of the subject.

Lieut.-Col. FREMANTLE withdrew his amendment.

Suggested Amendments.

Lieut.-Col. FREMANTLE moved in Subsection (3) to leave out the words "or steps have been taken to deal with him." He said he moved the amendment on behalf of Dr. Veron Davies, who felt very strongly on this point. His hon. friend wished to leave out as much as possible the control over the patient which was provided in the first four Clauses.

Mr. GREENWOOD, in resisting the amendment, said that the effect was really to cut out the express provision that in the circumstances dealt with in the Subsection a voluntary patient should be discharged, and they left him either under the principal Act or with treatment under Clause 5.

The amendment was negatived.

Lieut.-Col. FREMANTLE moved in Subsection (3) at the end to insert the words: "Provided that any written declaration by him, if he is over sixteen years of age when he was capable of volition, desiring that in the event of his losing volition his status should for a period of six months remain unaltered, be legal and binding on all concerned." He said this was really the third effort he had made on the same point. He had tried to make out the best case for those with experience, the Medico-Psychological Society. If they would not allow patients after they had lost volition to remain without further treatment for more than one month, would they do so if while the patient was still of full volitionary power he signed a definite application stating: "in case I lose volition for a period and you think I am recoverable, I want to remain under the same conditions in the same status of treatment"?

Mr. GREENWOOD said this was a very far-reaching amendment which was going to change entirely the method by which they had treated voluntary patients hitherto. It also raised controversial issues. While the proposal might appeal to many medical men, it was a very serious thing that a person should beforehand, so to speak, sign away his liberty. The case ought to be considered on its merits when the patient arrived at such a state that he was incapable of looking after himself. He hoped that the hon Member wound not press his amendment.

Lieut.-Col. FREMANTLE said most clearly the interests of all those who had asked him to move this amendment was to get the Bill through, and obviously if it did not commend itself to the Minister and the Committee in general it was not likely to get through the House. But the point having been raised it could be raised again later on some years hence in connection with an amending Bill. He asked leave to withdraw the amendment.

The amendment was withdrawn.

Dr. VERNON DAVIES moved in Subsection (4), after the word "such" to insert the words: "or fail to remove such person from the institution, hospital, home, or place when so requested in writing by the person in charge." He said he thought the new words would strengthen the Bill. There might be careless and incompetent guardians not very much interested in the case of a minor once they had got the patient under treatment.

Mr. GREENWOOD said he was not sure that the words would strengthen the Clause. He did *not* think that they added anything of value, but on the other hand, if they might be open to misunderstanding and all that could be brought within these words would be found in the word "duty" in the Subsection. He could not accept the amendment.

The amendment was negatived.

Mr. KINLEY moved an amendment to Subsection (4) to provide that the local authority should be consulted by the Board of Control in cases where a minor ceased to have a parent or guardian, or where the parent or guardian was incapable of performing, or refused or persistently neglected to perform, their duty.

Mr. GREENWOOD said the effective coordination desired by Mr. Kinley could be secured without this amendment and he imagined that the amendment might make it very difficult in many cases to secure any arrangements at all. One aspect of the Board of Control was that of an independent safeguard of persons who were in these institutions. If they were compelled to act in agreement with local authorities that immediately destroyed one of their important functions. This proposal would not work administratively.

Lieut.-Col. **Fremantle** said he sympathised with the object of the hon. Member, who moved the amendment, but he agreed with the Minister that it would be inadvisable to put the amendment into the Bill, because they were certain that the Board of Control would, whenever required, wish to be in touch with the local authorities and to make use of their machinery.

The amendment was negatived.

Penalty for Default.

Mr. **Kinley** moved to leave out Subsection (5), which imposes a penalty not exceeding £5 on any person who fails to give any notice required under the clause for each day or part of a day during which the default continues. He said an offence, however serious, could not be dealt with except by a penalty not exceeding £5. The punishment, if it was to fit the crime, should not be limited to that figure.

Mr. **Greenwood** pointed out that the effect of the amendment would be not that somebody would receive unlimited damages, but that no one could be punished. If they were to administer the Act at all, those responsible for giving notice, whether it be of the reception or of the death of a patient, must be under some penalty if they did not carry out their duties.

Sir **Boyd Merriman** said it should be made perfectly clear one way or the other whether the penalty was intended to cover Subsection (4) as well as Subsections (1) and (2). He suggested that they should insert words to the effect that a person should be liable if he failed to give any notice required under Subsection (1) and Subsection (2) of the Clause. That would put the matter beyond doubt.

Lieut.-Col. **Fremantle** said he had moved a former amendment seeking to establish the status of the medical superintendents by putting it clearly in writing that they should have definite authority to admit, discharge, etc., patients. That was refused by the Minister of Health because he said it must be left to the local authority. Surely the local authority who could give the necessary powers to their officials could presumably impose the necessary penalties? Why was it necessary to impose the penalties in the Bill and not trust the local authorities to deal with their own officers? Surely this was a retrogressive and inconsistent principle which had been too often adopted in respect of technical advisers. The reason probably was that this had always been done, and because it gave a feeling of security to the public. The medical superintendents themselves accepted that position, because public opinion was so timorous, but he hoped it would not be registered definitely that they were weighted down in that way.

Mr. **Greenwood** said local authorities did not feel insulted by this procedure, as it had been adopted before. Taking into consideration the number of private institutions quite clearly they ought to have some safeguard in the form of a penalty which would keep people up to their responsibilities.

Mr. **Kinley**'s amendment to delete the Subsection having been negatived, it was agreed, on the motion of Sir Boyd Merriman, to limit the penalty to failure to give notice required under Subsection (1) and Subsection (2) of the clause.

The clause as amended was added to the Bill.

Visitation of Voluntary Boarders.

On Clause 3, Mr. **Richard Russell** moved, in Subsection (1), to leave out the words "at any time visit a person received as a voluntary boarder under Section 1 of this Act or under the provisions of any local Act," and to insert instead: "at the request of any person received as a voluntary boarder under Section 1 of this Act, or under the provisions of any local Act, visit such person." He said the patients who submitted themselves for voluntary treatment, when they entered an institution, might be inspected the day after by a lunacy Commissioner, who might immediately certify them under the principal Act. That would be a fatal thing to happen. Nothing more disastrous to voluntary treatment could happen in any district.

Mr. **Greenwood** said he could not accept the amendment as it was based on a misapprehension. The idea that the Board of Control went about certifying people was, of course, without any foundation. What was being asked for was that no voluntary boarder should ever be visited by the Board of Control, except at the patient's request. They were told that this was being done for the protection of the patient, but such a proposal might very well be detrimental to his interests. For the general protection of persons in this category it was essential to keep independent power of inspection by the Board of Control.

Sir **Boyd Merriman** said the point of substance which he thought emerged from this discussion was whether there was any real safeguard in the Clause at all. If there were only to be five Commissioners would there ever be any real probability that Commissioners would visit voluntary patients with sufficient frequency to make their visits of any real effect for the purposes of the Bill? Though he quite understood that they could not possibly make it compulsory, the Committee would have very seriously to face later on whether there should not be more Commissioners so that visiting in this and other respects might be more effective.

Mr. **Greenwood** said it was true that there were five members of the Board, but it was part of the scheme to have a considerable staff of Visiting Commissioners. The actual visitation, therefore, was not confined to the Board of Control.

Lieut.-Col. **Fremantle** said the matter was not at all clear. It was true that Clause 11 provided for Commissioners other than the Board of Control. Those were the present Commissioners which composed the Board, 13 in number. He thought that there were to be nine of them left after this process of hari-kari, of whom five were to be members of the Board of Control, and the others senior Commissioners. Those who were being turned off the Board would be available to make visits, and he agreed that they needed people of that status for this purpose. But no provision was made in Clause 11 to replace the excellent men and women who were being turned off the Board of Control. When they died it was proposed that they should be replaced by assistant Commissioners and inspectors. He hoped that the Government would remedy this flaw in the Bill.

The amendment was negatived.

Clause 3 as amended was added to the Bill.

The Committee adjourned.

On Tuesday, March 11th, The Mental Treatment Bill was further considered by Standing Committee A of the House of Commons. Mr. Cecil Wilson was in the chair.

Power to Lodge Relatives and Friends of Boarders.

On Clause 4, Dr. **Vernon Davies** moved an amendment to provide that relatives or friends of patients might be lodged in any institution, or in any hospital, nursing home, or single care approved for this purpose by the Board of Control.

Miss **Susan Lawrence** (Parliamentary Secretary to the Ministry of Health) said that this clause was inserted in order to keep alive Clause 229 of the Lunacy Act. It was not desirable that this provision for lodging friends or relatives of patients should be extended to other institutions that registered hospitals or licensed houses. It had never been the practice to allocate accommodation which was reserved for patients in these other institutions, and the local authorities did not desire this extension. They did not want to make their asylums into great hotels.

Dr. **Morris-Jones** said he hoped the amendment would not be accepted. It might make it impossible to run the hospitals at all.

Dr. **Vernon Davies** pointed out that his amendment was permissive. It did not compel the proprietor of an institution to take in friends or relatives of patients if he had no room for them.

Replying to further questions, Miss **Susan Lawrence** explained that the clause as drafted did not include public institutions. It reproduced Clause 229 of the Lunacy Act in reference to licensed houses, and Section 230 as it had been interpreted in relation to registered hospitals. It also brought the law into conformity with the new provisions which dealt with three instead of two classes of patients.

The amendment was negatived.

Standard of Accommodation for Relations and Friends.

Lieut.-Col. **Fremantle** moved an amendment to enable friends or relatives to be lodged in accommodation which was of a lower standard than was required for the patients themselves. He said that a fairly high standard was required for patients, but there seemed no reason why other accommodation should not be used for patients' relatives.

Miss **Susan Lawrence** said that she hardly thought that the amendment was necessary. They must be strict in these matters, and they did not want boarders taken in beyond the number for which the house was licensed. The Royal Commission was divided on the question of licensed houses, and it was desired to leave them alone as far as possible.

Dr. **Morris-Jones** said that private licensed houses in this country could not extend the number of their beds beyond that allowed under the Lunacy Act of 1890. No proprietor of one of these houses would be likely to encourage friends or relatives to occupy the limited amount of accommodation which they had at their disposal.

Sir **Boyd Merriman** said that he thought that the Parliamentary Secretary was treating the matter rather too lightly. It was not to be dismissed merely by saying that by the milk produced or by the condition of the cow; and if this product continued to conform to the required standard, why had he issued an order restricting the movement of such animals if the owners, knowing their responsibilities, wished to do so; and (2) if the Minister had any evidence proving that cows exhibited at agricultural shows had become affected with tubercle at such shows; and if so, if he would lay such evidence before the House in a White Paper.—Miss Susan Lawrence (Parliamentary Secretary to the Ministry of Health) replied: The only satisfactory test for tubercle bacillus in milk is one which takes several weeks to carry out, and it is therefore necessary, in order to obtain the maximum possible safeguard againt the presence of tuberculosis in the milk in question, to lay down conditions as to the testing of the cattle and their isolation from untested animals. When a cow is found to be tuberculous it is rarely possible to determine how she has become infected, but my right hon. friend is advised that the association of tested with untested animals at a show involves a risk of infection which he would not be justified in taking in the interests of the consumers to whom he is, in effect, guaranteeing the milk as being of the highest possible purity.

Paupers and Vaccination.

Mr. Carter asked the Minister of Health whether he was aware that on Feb. 20th over 400 pauper inmates of the St. Pancras workhouse were vaccinated without being asked for their consent; that the majority of these people believed that the reason for stripping to the waist was for examination purposes only and had no idea that it was for vaccination until they were actually vaccinated; that the few men who successfully resisted this attempt to vaccinate them had their leave stopped; that no objection was raised to the men taking their discharge but only to their having leave; that Mr. L. L. Ross left the house on Feb. 22nd and returned at 7 P.M. with a new order of admission, and was told at the receiving ward that he must either agree to be vaccinated or go outside; that he refused to be vaccinated and demanded an order from the master in writing that vaccination was compulsory before he would agree to leave; that after an interview with the Assistant Master Ross was admitted 60 minutes after his arrival; that two men were refused admission on Feb. 21st at 5.30 P.M. after presenting their orders; and whether he would point out to the St. Pancras workhouse authorities that they had no right to make vaccination a condition of admission to the workhouse.—Mr. Greenwood replied: On Feb. 20th a male inmate was found to have been suffering from small-pox for three or four days and since he had been in contact freely with other inmates it was considered advisable to examine medically all the men in the institution. Opportunity was taken of advising the men to be vaccinated, but it was made clear that any who objected were at liberty to refuse. A number of men in fact refused, but no leave has been stopped on this account. As regards Mr. Ross, the facts are substantially as stated; the delay in readmitting him was due to a misunderstanding which was rectified as soon as it was brought to the notice of the Assistant Master, and steps have been taken to prevent a recurrence of the difficulty. There is no record of two men being refused admission on Feb. 21st. The duty of a poor-law authority to relieve destitution would not be affected by a refusal of the applicant to be vaccinated, but in certain circumstances it might be quite proper that relief should not be given in a particular institution.

Patients' Comfort in Poor Law Hospitals.

Dr. Hastings asked the Minister of Health whether he would take steps, in the case of Poor Law hospitals, to stop the practice of awaking patients at five o'clock in the morning for the purpose of ablutions, when these could be carried out at a more reasonable hour without interfering with their sleep.—Mr. Greenwood replied: I am anxious that everything possible should be done to study the comfort of patients and this matter is one which is constantly under consideration. I have been interested to see the steps proposed in this regard in the important hospital with which my hon. friend is connected, but as he will appreciate the subject is one in which it is difficult to make general recomdations.

Local Authorities and Birth Control.

Mr. Thurtle asked the Minister of Health the names of the 55 or more local authorities who had sent resolutions to his department in favour of local authorities being permitted to give birth-control information to married women who desired it.—Mr. Greenwood replied: I am sending the list to my hon. friend.

Silicosis.

Mr. Rennie Smith asked the Home Secretary if, following the recent Report on the conditions of silicosis, further legislation was being prepared, and when the Bill would be presented to the House.—Mr. Clynes replied: Yes, Sir. A Bill is being prepared and while I cannot pledge the Government I hope that it may be presented to Parliament before the end of the present month.

Mr. Rennie Smith asked the Home Secretary if he could give particulars of the committee appointed by the Medical Research Council further to investigate pulmonary silicosis, and other pulmonary conditions arising from industrial processes; and if he could indicate the scope of the inquiry.—Mr. Clynes replied: The appointment of this Committee and the scope of their inquiry were announced in the Press of Feb. 22nd. The Committee will advise on the further investigation of pulmonary silicosis and of other pulmonary conditions associated with the inhalation of dusts arising from industrial processes. It will be their duty to survey the whole field and to advise the Council on new lines of inquiry that may be profitably pursued, and they will assist in the supervision of such investigations as it may be decided to initiate or support. The work will be directed particularly towards obtaining, in coöperation with the Factory Department, more accurate knowledge of the causes and diagnosis of silicosis and of other industrial pulmonary disorders.

Supply of Radium.

Lieut.-Commander Kenworthy asked the Minister of Health whether any progress had been made in obtaining supplies of radium independently of the present foreign monopoly, and especially from mines and workings within the Empire; and what steps were being taken to this end.—Mr. Greenwood replied: The primary objective is to increase the amount of radium at present available for use in this country and the Radium Trust has thought it best with that object to have recourse to the existing sources of supply, including such supply as is available in this country.

Approved Societies' Reserve Funds.

Dr. Morris-Jones asked the Minister of Health the total amount of reserve funds possessed by approved societies under the National Health Insurance Acts as at Dec. 31st, 1929.—Mr. Greenwood replied: The total amount of funds of approved societies under the National Health Insurance Acts in Great Britain at the latest date for which particulars are available, viz., Dec. 31st, 1928, was in round figures as follows:—

1. Sums standing to the credit of approved societies in the National Health Insurance Funds, including amounts in the Investment Account..	£59,000,000
2. Sums invested by or on behalf of approved societies	55,000,000
3. Cash in hands of approved societies	1,500,000
Total	£115,500,000

Apart from the foregoing, there are also certain book credits called reserve values, created under those provisions of the original National Insurance Act, and subsequent enactments, which are now embodied in Section 66 of the National Health Insurance Act, 1924. These book credits will in due course be converted into cash by the operation of the sinking fund set up for the purpose. (See Section 67 of the National Health Insurance Act, 1924.) The amount of reserve values credited to approved societies in Great Britain and outstanding at Dec. 31st, 1928, was in round figures £47,500,000.

Sale of Reconstituted Milk.

Mr. Everard asked the Minister of Health, whether he was aware that at a recent food and cookery exhibition at Olympia, London, reconstituted milk was supplied to members of the public, and that a firm of manufacturers of emulsifying machines had advertised the claim that milk and cream made on their stand was supplied to all the demonstration and competition theatres at that exhibition; and whether, in view of the extended sale of emulsifying machines, he would take prompt steps to remind all food and drugs authorities that the sale of reconstituted milk was illegal.—Mr. Greenwood replied: I have received information to the effect of the first part of the question. The Food and Drugs Authorities are already aware of the statutory provision prohibiting the sale of reconstituted milk as milk, and on the information at present before me I do not think it necessary to address any special communication to them on the subject.

Factory Inspectorate.

Mr. Kelly asked the Home Secretary whether there had been any increase in the number of factory inspectors during the last year; and whether any further increase was proposed.—Mr. Clynes replied: No addition was made last year to the total strength of the inspecting staff. As regards the future, my hon. friend will no doubt have seen the announcement in the newspapers of the important changes which the Government have decided to make in the strength and organisation of the Factory Inspectorate. These include increases (to be spread over a period of five years) both in the general inspection staff and in the technical branches (medical, engineering and electrical). The general inspection staff attached to the inspection Divisions and Districts will be raised in number from 180 to 243. The technical branches will also be substantially increased, the medical staff from 5 to 8; the electrical staff from 5 to 12; and the engineering staff from 6 to 10. During the year 1930–31 it is proposed to appoint 16 additional inspectors to the divisional and district staff, making, with seven vacancies in the existing inspectorate, a total of 22 new inspectors to be appointed this year. In the technical branches two medical, two engineering and four electrical inspectors will be added.

TUESDAY, MARCH 11TH.

Doctors and Excessive Prescribing.

Mr. SORENSEN asked the Minister of Health whether he was aware that penalties were imposed on doctors recently for excessive prescribing; whether he was aware of the dissatisfaction that existed at this limitation of the purpose of health insurance; and whether he intended to take action that would remedy the situation.—Miss LAWRENCE replied: My right hon. friend gathers from the terms of my hon. friend's question that he is not aware that power to withhold remuneration from insurance doctors on account of excessive prescribing has existed and has been exercised since medical benefit first came into operation in 1913. No limitation of the scope of medical benefit is involved, and the answer to the third part of the question is therefore in the negative.

Sickness and Disablement Benefits.

Mr. RHYS DAVIES asked the Minister of Health if his attention had been called to the distress caused among those insured persons whose disablement benefit had recently been reduced under the provisions of the National Health Insurance Act, 1928; and, if so, if he would inquire into the matter with a view, if possible, to a return to the status quo in this connexion; and if he could state approximately the number of insured persons whose disablement benefit had recently been reduced consequent upon the operations of the provisions of the National Health Insurance Act, 1928.—Miss LAWRENCE (Parliamentary Secretary to the Ministry of Health) replied: My right hon. friend is aware that there has been some misapprehension with regard to the reduction in the standard rates of sickness and disablement benefits payable to insured persons after the lapse of a long period without the payment of any contributions. No statistics are available as to the number of persons who are subject to such reduction, but as the payment of a single contribution for any week after June, 1928, would have been sufficient to prevent the reduction, my right hon. friend does not think that there can be many cases of the kind. The great majority of such cases would be those of persons who have paid no contributions for many years and who would, but for a special regulation which my right hon. friend recently made, have ceased to be insured and entitled to any benefits at the end of 1929. My right hon. friend is afraid that it would be very difficult to justify any further concession to these people at the cost of the benefit funds of approved societies.

Industrial Health Research Board.

Mr. MANDER asked the Secretary of State for War if he could give the results of the work carried out at the Beachley Technical School on behalf of the Industrial Health Research Board by the National Institute of Industrial Psychology in connexion with the War Office; and if he proposed to develop the matter further.—Mr. T. SHAW replied: Investigations have been undertaken with the assistance of the National Institute of Industrial Psychology to see what would be the best method of allocating to a trade boys entering the Army Technical School (Boys) at Chepstow and elsewhere as apprentice tradesmen. These investigations are still proceeding.

AN ENLARGED COTTAGE HOSPITAL.—Neston (Cheshire) and District War Memorial Cottage Hospital has been enlarged by the building of two new wards and other additions, which were recently opened by Lady Leverhulme.

MEMORIAL TO LORD HAMBLEDEN.—A bust of the late Lord Hambleden has been erected in the north-east corner of Lincoln's Inn-fields. He was for 14 years vice-chairman and for 20 years chairman of King's College Hospital, for nine years chairman of the British Hospitals Association, and one of the founders and chairman of the Hospital Saving Association.

Obituary.

HORACE STANSFIELD COLLIER, F.R.C.S.,

LATE SURGEON TO ST. MARY'S HOSPITAL.

WE regret to announce the death of Mr. Stansfield Collier, which occurred at Teynham, Kent, on Feb. 26th, after prolonged illness.

Horace Stansfield Collier was the elder son of Dr. Alfred H. Collier of Cranford, and received his medical education at St. Mary's Hospital, taking the double English qualifications in 1888, and proceeding to the F.R.C.S. in 1890. At the hospital he held the usual junior appointments, and in 1897 was elected assistant surgeon. Previous to that appointment he had been a resident at the London Fever Hospital, demonstrator of anatomy at St. Mary's Hospital, and assistant surgeon to Paddington Green Children's Hospital, while in 1898 he was elected surgeon to the Great Ormond-street Children's Hospital. The direction of his clinical work and surgical interests was early indicated, and during the whole of his long connexion with St. Mary's Hospital and with Great Ormond-street he preserved the same attachment to surgical pædiatrics.

We owe the following estimate of Stansfield Collier as colleague and teacher to Sir William Willcox:—

Horace Stansfield Collier will be remembered with affection and gratitude by many of his contemporaries at St. Mary's Hospital, and at the Hospital for Sick Children, Great Ormond-street. He was a student of St. Mary's Hospital, and, before qualifying, decided upon surgery for his future career. The enthusiasm and energy displayed in his work were remarkable, and it is feared were the cause of his early breakdown in health at a time when he had risen to a high position in the surgical world of this country. He was demonstrator of anatomy at St. Mary's Hospital from 1894 to 1898, and surgical tutor from 1897 to 1902. In 1897 he was elected to the staff of St. Mary's Hospital as assistant surgeon, and, shortly after this, was appointed to the surgical staff of the Great Ormond-street Hospital. He did a colossal amount of surgery during the period 1897–1911 and completely overtaxed a constitution that was none too strong. His health gave way in 1911, so as to necessitate his retirement from hospital practice.

Stansfield Collier was a man of lovable disposition and attractive personality. He gathered round him a host of friends amongst his colleagues, his students and the practitioners with whom he became associated. His generous disposition always made him thoughtful of the future careers of those junior to him, whatever their professional bent, and he spared no effort to encourage them in their early struggles. He was an able and attractive teacher, and was held in the highest esteem by the large number of students who attended his lectures and tutorial classes in surgery. There are many occupying high positions in the medical profession to-day whose successful careers were largely due to the helping hand extended to them by Stansfield Collier. As a surgeon the brilliancy of his diagnosis and operative skill soon made him known far outside the confines of the hospitals with which he was associated and he speedily acquired a very large practice; indeed his services became in great demand all over England, for he was seen to be a man of great originality, both in operative technique and in scientific after-treatment of cases. As, however desperate the situation might be, he never gave up hope, on many occasions remarkable recoveries resulted in apparently hopeless cases under his care. One example may be mentioned—a gymnastic instructor in the army fell in the course of his exercises and fractured the sixth and seventh cervical vertebræ. He lay completely paralysed for some months. Collier performed laminectomy, removed the broken fragments of bone pressing on the cord, and the patient made a complete recovery, Wolverhampton Eye Infirmary.—All the figures for last year's work show an increase. The new patients totalled 14,230. There were 7030 accident cases, as against 4580 ten years ago. A new ultra-violet ray department has been provided.

Radium Therapy in Cancer.—Dr. J. Murdoch, Chief Medical Officer of the Department of Radiology and Radium Therapy at the Brugmann Hospital, Brussels, will lecture on this subject at the University of Sheffield on Tuesday, May 6th. This will be the third of a series of lectures arranged by the University in coöperation with the Yorkshire branch of the British Empire Cancer Campaign. It will be open to all medical practitioners, but those who wish to come from outside areas are asked to send their names to the secretary of the Clinical Studies Committee of the University.

London School of Medicine for Women.—On Friday evening, March 7th, Lady Barrett held a reception at the London School of Medicine for Women in Hunter-street, W.C., to welcome Dame Janet Campbell on her return from Australia. A large number of guests joined in the welcome, and took an opportunity of inspecting the medical school, where various popular exhibits were put out. During the evening Prof. Ainsworth Davis demonstrated a film showing the growth of tissues to big audiences, while an interesting musical programme was rendered by Mr. Hugh Mackay, Mr. Phelps, and Miss Sheelah Field. Mr. Mackay sang old ballads, traditional in Scottish villages, and illustrative of legend, scenery, and especially farm labour; these were well suited in their accompaniments, Miss Field as harpist being very successful.

Public Assistance Hospital Arrangements.—At Darlington the two senior women members of the Board of Guardians have been coöpted as members of the Public Assistance Committee, which otherwise consists entirely of members of the Town Council. Feetham's Infirmary is to be renamed "Darlington Municipal Hospital."—In January the Wiltshire County Council found that there were 350 empty beds in various public institutions in the county, and it is proposed to obtain space for mental defectives and increased hospital accommodation by rearranging the uses to which these institutions have been put.—At Newcastle-on-Tyne it is proposed to transfer tuberculous patients from Wingrove Hospital to the phthisis pavilions at Walkergate Isolation Hospital or to Barrasford Sanatorium. Mental defectives will probably be removed from Wingrove to Shotley Bridge Colony when they are certified as suitable for treatment in that manner.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
Tuesday, March 18th.—5.30 p.m., Ballot for election to the Fellowship. 8 p.m., Pathology. Election of Officers and Council. Communications: W. W. C. Topley: Antibodies in Rabbits. Joan Taylor and H. D. Wright: Hæmolytic Streptococci in the Normal Vagina. G. R. Cameron and B. T. Mayes: The Effect of Tying the Hepatic Artery. Demonstration: J. W. Orr: Primary Carcinoma of the Liver in a Case *of Hæmochromatosis*.
Thursday.—5 p.m., Dermatology and Medicine (Cases at 4 p.m.). Special Discussion on The Therapeutic Value of Gold Compounds, Sanocrysin, &c. Openers: Prof. Lyle Cummins and Dr. A. C. Roxburgh.
Friday.—5 p.m., Balneology and Climatology. Discussion on The Influence of Sunlight and Other Climatic Factors in Health and Rheumatic Diseases. Opener: Dr. Charles W. Buckley. 8 p.m., Obstetrics and Gynæcology. Short Communication: Dr. J. Estcourt Hughes: A Case of Hydatidiform Mole with Multiple Syncytial Infarction of the Lungs. Papers: Dr. Arthur E. Giles: The Influence of Hysteropexy on Subsequent Pregnancy and of Pregnancy on a Previous Hysteropexy. Prof. W. Fletcher Shaw: The Treatment of Prolapsus Uteri. 8.30 p.m., Electro-Therapeutics. Paper: Dr. J. M. Woodburn Morison: Diaphragmatic Hernia.

ROYAL INSTITUTION, 21, Albemarle-street, W.
Tuesday, March 18th.—5.15 p.m., Dr. Charles Singer: Science of the Renaissance.
Thursday.—5.15 p.m., Mr. J. B. S. Haldane: Some Problems of Genetics.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.
Thursday, March 20th.—8.15 p.m. (at the Royal Army Medical College, Grosvenor-road, Millbank), the following amongst others will give Demonstrations: Dr. S. Adler, Sir Aldo Castellani, Colonel A. C. H. Gray, Dr. C. A. Hoare, Lieut.-Colonel S. P. James, Dr. William James, Mr. C. MacHattie and Major C. R. Chadwick, Mr. J. F. Marshall.

LONDON CLINICAL SOCIETY.
Tuesday, March 18th.—8.30 p.m. (at the London Temperance Hospital), Clinical Evening. Cases.

CHELSEA CLINICAL SOCIETY.
Tuesday, March 18th.—8.30 p.m., Dinner at the Hotel Rembrandt, Thurloe-place, S.W., followed by a discussion on Micturition. Openers: Mr. J. Everidge and Sir Thomas Carey Evans.

ROYAL MICROSCOPICAL SOCIETY, 20, Hanover-square, W.
Wednesday, March 19th.—7.30 p.m., Mr. Joseph E. Barnard, F.R.S.: Presidential Address on Resolution and Visibility in Medical Microscopy.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
Tuesday, March 18th.—5 p.m., Dr. Donald Hunter: The Significance to Clinical Medicine of Studies in Calcium and Phosphorus Metabolism. (Last Goulstonian Lecture).
Thursday.—5 p.m., Dr. Carey F. Coombs: Syphilis of the Heart and Great Vessels. (First Lumleian Lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
Monday, March 17th to Saturday, March 22nd.—Medical Society Lecture Room, 11, Chandos-street, Cavendish-square, W. Tues., 4 p.m., Lecture by Dr. John Parkinson on X Ray Examination of the Heart. No fee.—Royal Westminster Ophthalmic Hospital, Broad-street, W.C. Thurs., 2.30 p.m., Demonstration by Mr. M. L. Hine. No fee.—National Hospital for Diseases of the Heart, Westmoreland-street, W. Thurs., 3 p.m., Demonstration by Dr. F. W. Price. No fee.—West End Hospital for Nervous Diseases, 73, Welbeck-street, W. Special Post-graduate Course of Lectures and Clinical Demonstrations. Daily at 5 p.m.—London Lock Hospital, Dean-street, W. Post-graduate Course in Venereal Disease. Clinical instruction daily in the afternoons and evenings for four weeks.—Royal National Orthopædic Hospital, Great Portland-street, W. Second week of Post-graduate Course in Orthopedics occupying all day.—Further particulars from *Fellowship of Medicine.*

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
Monday, March 17th.—2.30 to 5 p.m.: Medical, Surgical, and Gynæcological Clinics. Operations.
Tuesday.—2.30 to 5 p.m.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.
Wednesday.—2.30 to 5 p.m.: Medical, Skin, and Eye Clinics. *Operations.*
Thursday.—11.30 a.m.: Dental Clinics. 2.30 to 5 p.m.: Medical, Surgical, Nose, Throat, and Ear Clinics. Operations.
Friday.—10.30 a.m.: Throat, Nose, and Ear Clinics. 2.30 to 5 p.m.: Surgical, Medical, and Children's Diseases. Clinics. Operations.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James Hospital, Ouseley-road, Balham, S.W.
Thursday, March 20th.—4 p.m., Dr. Maurice Davidson: Some Points in Differential Diagnosis and Treatment in Diseases of the Chest.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark Hill, S.E.
Thursday, March 20th.—9 p.m., Dr. H. G. Hodgson: Radiology.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL.
Friday, March 21st.—4 p.m., Mr. Nicol Rankin: Acute Affections of the Pharynx.

ROYAL DENTAL HOSPITAL OF LONDON, Leicester-square, W.C.
Wednesday, March 19th.—6 p.m., Mr. E. W. *Fish*: A Theoretical Review of Treatment of the Dentine.

NATIONAL HOSPITAL POST-GRADUATE COURSE, Queen-square, W.C.
Monday, March 17th.—12 noon, Dr. Greenfield: Pathology *of Nervous System.* 2 p.m., Dr. Riddoch: Out-patient Clinic. 3.30 p.m., Dr. Adie: Forms of Muscular Atrophy.
Tuesday.—2 p.m., Dr. Walshe: Out-patient Clinic. 3.30 p.m., Dr. Grainger Stewart: Acute and Subacute *Myelitis.*
Thursday.—2 p.m., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 p.m., Dr. Riddoch: Headache.
Friday.—12 noon, Dr. *Purdon* Martin: Anatomy and Physiology of Nervous System. 2 p.m., Dr. Adie: Out-patient *Clinic.* 3.30 p.m., Dr. Symonds: Disseminated Sclerosis.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
Tuesday, March 18th.—4.15 p.m., Mr. C. Roberts: Carcinoma of the Rectum.
Friday.—4.15 p.m., Dr. F. R. Ferguson: Demonstration of Medical Cases.

ANCOATS HOSPITAL POST-GRADUATE COURSE, Mill-street, Manchester.
Thursday, March 20th.—4.15 p.m., Dr. N. Klotz: Affections of the Kidneys with Special Reference to Nephritis.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
Friday, March 21st.—3.30 p.m. (at the Royal Infirmary), Dr. Hallam: Some Common Skin *Diseases.*

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
Wednesday, March 19th.—4.15 p.m. (Royal Samaritan Hospital). Dr. D. Shannon: Gynæcological Cases.

Appointments.

CAMPBELL, J. M. H., M.D., B.Ch. Oxf., F.R.C.P. Lond., has been appointed Physician to Out-patients, National Hospital for Diseases of the Heart.

FRANKS, O., M.D. Brux., L.S.A., D.P.H., Deputy Medical Officer of Health for Durham County.

HANNA, MARGARET R., M.B., B.Ch., D.P.H. Belf., Assistant Medical Officer of Health, Huddersfield.

IREDELL, C. E., M.D. Lond., M.R.C.P. Lond., M.R.C.S., Physician in charge of Electro-Therapeutic Department, Freemasons Hospital and Nursing Home, Fulham-road, S.W.

LOBBAN, J. W., M.B., Ch.B. Aberd., D.P.H., Assistant Medical Officer of Health and Assistant School Medical Officer for Chester.

RIDDELL, JAMES W. G. H., M.D. Edin., F.R.C.S. Edin., Honorary Assistant Surgeon in charge of the Obstetrical and Gynæcological Department, South Devon and East Cornwall Hospital, Plymouth.

Vacancies.

For further information refer to the advertisement columns.

Albert Dock Hospital, Connaught-road, E.—M.O. At rate of £110.

Aylesbury, Royal Buckinghamshire Hospital.—Res. M.O. At rate of £180.

Barbados.—Sanitation Officer. £600.

Barnsley, Beckett Hospital and Dispensary.—Jun. H.S. £140.

Birmingham and Midland Eye Hospital.—Res. Surg. O. £150.

Birmingham, Dudley-road Hospital.—Jun. Asst. M.O.'s. All at rate of £200.

Birmingham General Hospital.—Two Res. Anæsthetists. Each £120. Also three Res. H.S.'s. Each £70.

Bolton Infirmary and Dispensary.—H.S. At rate of £150.

Bridlington Borough.—M.O.H., and School M.O. £800.

Brighton, Royal Sussex County Hospital.—H.S. £150.

Bury Infirmary.—Sen. H.S. Also 3rd H.S. At rate of £250 and £150 respectively.

Burnley, Victoria Hospital.—H.P. At rate of £125.

Buxton, Derbyshire, Devonshire Hospital.—Asst. H.P. At rate of £150.

Calcutta School of Tropical Medicine.—Prof. of Path. and Bact. Rs. 850 a month.

Cambridge, Addenbrooke's Hospital.—H.P. Also Two H.S.'s. Each at rate of £130.

Charing Cross Hospital, W.C.—Asst. Physician.

Chester County Mental Hospital.—4th Asst. M.O. £350.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.

Connaught Hospital, Orford-road, E.—Sen. Res. M.O. At rate of £150. Also Res. H.S. and H.P. Each at rate of £100.

Dreadnought Hospital, Greenwich.—H.P. and H.S. At rate of £110.

Dudley, Guest Hospital and Eye Infirmary.—Asst. H.S. £150.

Durham County Council.—Venereal Diseases M.O. £750.

East London Hospital for Women and Children, Shadwell, E.—Cas. O. At rate of £125.

Edinburgh Hospital for Crippled Children.—Surgeon. £1000.

Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.

Freemasons Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Radiologist.

Guildford, Royal Surrey County Hospital.—H.S. £150.

Hertfordshire County Council, County Sanatorium, Ware Park.—Asst. M.O. £350.

Hospital for Sick Children, Great Ormond-street, W.C.—Res. M.O. for County Branch Hospital, Tadworth, Surrey. At rate of £250.

Hospital for Tropical Diseases, Endsleigh-gardens, W.C.—Two H.P.'s at rate of £150.

Hove, Lady Chichester Hospital.—Jun. H.P. At rate of £50.

Hull Royal Infirmary.—H.S. Also Cas. H.S. At rate of £150 and £130 respectively.

Ipswich, East Suffolk and Ipswich Hospital.—Two H.S.'s. Each £120.

Ipswich Sanatorium.—Asst M.O. £350.

Kensington, Fulham, and Chelsea General Hospital, 194, Finborough-road, Earl's Court, S.W.—Res. Cas. M.O. At rate of £100.

Kettering Urban District Council.—Part-time M.O. for Antenatal Work.

Leeds Public Dispensary.—Jun. Res. M.O. £150.

Liverpool, Hahnemann Hospital, Hope-street.—Res. M.O. At rate of £100.

Liverpool Open-air Hospital for Children, Leasowe.—Jun. M.O. £150.

Liverpool, Royal Southern Hospital.—H.P., H.S., and M.O. Each £60. Also Cas. O. £100.

L.C.C.—Med. Supts. for Public Health Dept. £750–£1000.

L.C.C. Public Health Department.—Temp. Asst. Aurist. 34*s.* 6*d.* per session.

London Hospital, E.—Asst. Radiologist.

London Lock Hospital, 91, Dean-street, W.—1st and 2nd H.S.'s Each at rate of £200. Also Surg. Reg. £100.

London Lock Hospital, 283, Harrow-road, W.—Surg. Reg. £100.

London Temperance Hospital, Hampstead-road, N.—Res. M.O. Also H.P. At rate of £175 and £100 respectively.

Macclesfield General Infirmary.—2nd H.S. At rate of £150.

Manchester, Ancoats Hospital.—Res. Surg. O. £200.

Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Jun. Res. M.O. At rate of £50.

Manchester Royal Children's Hospital, Pendlebury.—Asst. Phys. £50.

Manor House Hospital, Golders Green, N.W.—H.S. At rate of £200.

Metropolitan Hospital, Kingsland-road, E.—Physician to Dept. for Diseases of Skin.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Res. M.O. £250.

New Zealand, Wellington General Hospital.—Radiologist. £900.

Northern Rhodesia, Roan Antelope Copper Mines, Ltd.—2nd M.O. £900–£1000.

North Riding of Yorkshire County Council.—Asst. M.O. £600.

Northwood, Middlesex, Mount Vernon Hospital.—Radiologist. £1000.

Norwich, Norfolk and Norwich Hospital.—Hon. Asst. S.

Nottingham City Infirmary.—Res. Med. Supt. £900.

Nottingham General Hospital.—2nd Cas. O. At rate of £150.

Oswestry, Shropshire Orthopædic Hospital, &c.—Two H.S.'s. Each at rate of £200.

Portsmouth, St. Mary's Hospital, Institution, and Children's Home.—3rd Asst. Res. M.O. £250.

Prince of Wales's General Hospital, Tottenham, N.—Hon. Phys. Also Sen. H.P., Sen. H.S., and Special H.S. Each at rate of £120. Also Jun. H.P., and Two Jun. H.S.'s. Each at rate of £90.

St. Helens Hospital, Lancashire.—Res. M.O. £250.

St. Mary's Hospital, W.—Sen. and Jun. Clin. Assts. £100 and £50 respectively. Also Obstetric Registrar. £50.

Salford City.—Jun. Asst. for Venereal Diseases Centre. £500.

Salford City Infectious Diseases Hospital.—Jun. Asst. Res. M.O. £200.

Salford Royal Hospital.—H.P., Two H.S.'s, also Cas. H.S. All at rate of £125.

Sheffield Royal Infirmary.—Ophthalmic H.S. At rate of £80.

Society of Apothecaries, Water-lane, Blackfriars, S.E.—Med. Reg. £500.

Stirling District Mental Hospital, Larbert.—Jun. Asst. M.O. £300.

Stockport, Stepping Hill Hospital, &c.—Res. Asst. Med. Supt., &c. £300.

Surrey County Council.—Asst. M.O. £600.

Wakefield, Clayton Hospital.—Two H.S.'s. Each at rate of £150.

Walsall General Hospital.—Cas. H.S. At rate of £120.

Watford, Herts, Peace Memorial Hospital.—2nd Res. M.O. At rate of £150.

West Bromwich and District General Hospital.—Cas. H.S. At rate of £200.

West Bromwich, Hallam Hospital.—Res. H.S., and Res. H.P. Each £250.

West London Hospital, Hammersmith-road, W.—Hon. Asst. Surg., Hon. Med. Reg., and Hon. Obstet. Reg.

Woolwich and District War Memorial Hospital, Shooters-hill.—H.P. and H.S. Each at rate of £125.

Willesden General Hospital, N.W.—Clin. Assts. to Surgical Out-patients' Dept.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Ramsey (Hunts), Llandudno (Caernarvon), and at Rhayader (Radnor).

Births, Marriages, and Deaths.

BIRTHS.

HOBBS.—On March 9th, at 4, Downing-street, Farnham, the wife of F. B. Hobbs, M.D., M.R.C.P., of a son.

KILNER.—On March 3rd, at North Hill, Bury St. Edmunds, the wife of Dr. S. D. Kilner, of a daughter.

TOOP.—On March 3rd, at Advie, Brunswick-road, Sutton, the wife of Dr. Howard Toop, of a son.

MARRIAGES.

GAVIN—HARRIS.—On March 4th, at Christ Church, Westminster, Dr. Alexander Gordon Douglas Gavin, M.C., to Helen Mary, elder daughter of Mr. and Mrs. G. F. Harris, of St. James'-court, S.W.

HAUXWELL—REID.—On March 10th, 1930, at the Parish Church of South Clapham, London, by the Rev. W. A. Dunn, Frank Hauxwell, M.B., Ch.B., D.P.H., Medical Officer of Health, St. Helens, Lancs, eldest son of the late Rev. F. M. and Mrs. Hauxwell, Carluke, Lanarkshire, to Margaret A. Reid, M.B., Ch.B., eldest daughter of Mr. and Mrs. Reid, 4, Abbeville-road, South Clapham, London.

STRUTHERS—TOUGH.—On March 3rd, at Holy Trinity Church, Edinburgh, John William Struthers, M.B., F.R.C.S., to Theresa Anne Ross, widow of Captain J. J. Tough, R.A.M.C.

DEATHS.

GAMACK.—On March 8th, at Oriel House, Lindfield-gardens, Hampstead, Alexander Gamack, M.D., aged 96.

GIMLETTE.—On March 7th, at Sandford House, Merton-road, Southsea, George Hart Jesmond Gimlette, C.I.E., M.D., Lt.-Col., retired, Indian Medical Service.

PIPER.—On March 5th, suddenly at King's Leigh, Whitstable, Francis Parris Piper, M.B. Lond., M.R.C.S., L.R.C.P., M.O.H.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

RHEUMATISM IN INSURANCE PRACTICE.

Now armed with this rough practical classification as with a spectroscope, let us see how our observers in 1922 divided "industrial rheumatism" into its component diseases.

Perhaps we can best visualise this spectrum of industrial rheumatism in terms of attack-rates per 1000 of all ages by supposing a practitioner to have a practice consisting of 1000 insured males and 1000 insured females. Of this "population at risk" of 2000 insured persons of all ages over 16 years of age, our experience suggested that about 46·5 per cent., or 930 patients, would seek medical advice with regard to all illnesses during a year, and of these 930 patients some 55 (or 5·9 per cent.) would be treated for rheumatic diseases in the following proportions:—

TABLE IV.

Groups.	—		Insured males.		Insured females.	
Acute rheumatic.	A	Acute rheumatism ..	1	4	2	5
		Subacute " ..	3		3	
Fibrositis ..	B	Muscular rheumatism	6	19	7	11
		Lumbago	10		3	
		Sciatica or brachial neuritis	3		1	
Chronic arthritis	C	Rheumatoid arthritis	1	8	3	6
		Osteo-arthritis ..	3		2	
		Gout	3		0	
		Unclassifiable arthritis ..	1		1	
Total "rheumatic" disease ..			33*		22	
			55			

* Discrepancy due to omission of decimal points.

In the groups A and B the figures may be taken as rough attack-rates for all ages above 16 per 1000 per annum, but with the chronic group it must be remembered that as these diseases persist and require treatment for years the figures are not annual attack-rates.

So much for our spectrum of insured "rheumatic" patients. Now let us subject our total rheumatic insured invalidity (measured by *duration* of rheumatic sickness) to the same test. It will be recalled that it amounts to 14 per cent. of the total insured sickness and disablement.

The relative economic importance of each disease can be measured by the sick absence produced by that disease, expressed as a percentage of the whole sick absence due to all rheumatic diseases. For males, osteo-arthritis is easily the largest producer of sick absence, with 22 per cent. of the total; next is rheumatoid arthritis with 17 per cent.; then *muscular rheumatism* with 12 and gout with 11; lumbago comes lower than might be expected from the vast number of patients with 11 per cent.; subacute rheumatism with 10 per cent.; sciatica with 9 per cent. Unclassifiable chronic joint change diseases are responsible for 5 per cent. and acute rheumatism for only 4 per cent. of the total "rheumatic" sickness. Among the females, partly no doubt owing to the younger age distribution, the acute group is much more prominent than in the males, and causes exactly the same amount of sick absence as the non-articular manifestations group, which is considerable on account of the large amount of sickness caused in females by muscular rheumatism.

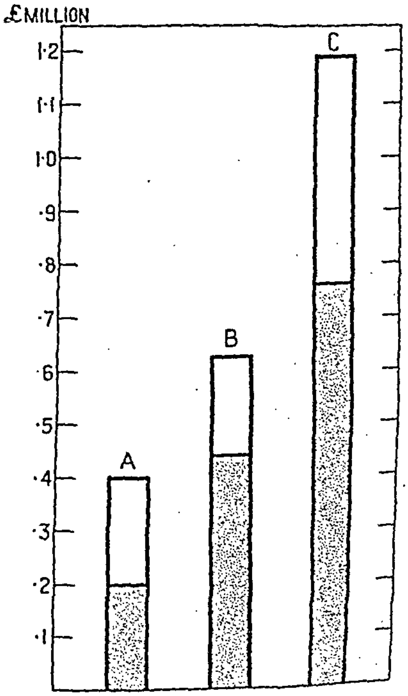
Of the separate diseases rheumatoid arthritis causes by far the most sickness, with 30 per cent. of all female rheumatic sick absence.

For both sexes together, rheumatoid arthritis and osteo-arthritis are nearly equal and far ahead of the other rheumatic diseases as producers of incapacity for work, and the proportions of sick absence produced by the acute group, the non-articular group, and the chronic joint change group respectively are nearly in the proportion 2 : 3 : 6. That is to say, chronic joint diseases cause twice as much incapacity for work as muscular rheumatism, fibrositis, lumbago, and sciatica combined, and three times as much as acute and subacute rheumatism, and when this is translated into sickness and disablement benefit we see in Fig. 3 the cost of each group in each sex to the approved societies.

Here I must point out that insured females have a much younger age distribution than insured males, in that 45·6 per cent. of insured females are between 16 and 25, and 72·7 ‡ per cent. under 35 years of age (compared with 26 per cent. and 51·6 per cent. respectively of insured males). Many women drop out of insurance on marriage.

This young age distribution of insured females makes disease statistics relating to the insured female population a much less valuable guide to the incidence of diseases upon the whole female population, for these young age-groups are relatively almost immune from the chronic rheumatic diseases. The proportion of rheumatic sick absence per person increases rapidly as age advances—a man of 55–64 having on an average 16 times as much rheumatic sick absence as one between 16–24. It is therefore essential when studying the incidence of chronic rheumatism to bear in mind the age-grouping of the population, and to examine our material *divided into* age-groups.

FIG. 3.



Estimated relative cost in benefit of the several "rheumatic" disease groups during 1928. A = Rheumatic fever (acute rheumatism) and subacute rheumatism. B = Fibrositis. C = Chronic joint stages. The stippled areas represent males.

Fig. 4 shows the male attack-rates at each age-group of the three main divisions of rheumatic diseases, and so much more common are the chronic diseases that I have put the attack-rates of the acute group in on a scale ten times larger than the two chronic groups.

It will be noticed at once the fundamental difference that the incidence of the acute group falls with increasing age, whilst the two *chronic groups* rise steeply with advancing age. The attack-rates of the various forms of fibrositis and *arthritis* have a *strong* general resemblance—a slow gradual rise in young adult life until the age of 45 is reached, when there is a sudden and pronounced upward jump. *After* 65 there is another violent upward movement due to the degenerative senile processes, but the *rise after* the age of 45 is, I think, quite clearly due to something that is not senility, but which may be probably due to endocrine changes, particularly those connected with the menopause in women. Llewellyn [19] says:—

> "The tendency of rheumatism to change its *facies* at puberty, the predilection of rheumatoid for *the* reproductive period, and of osteo-arthritis and gout for the

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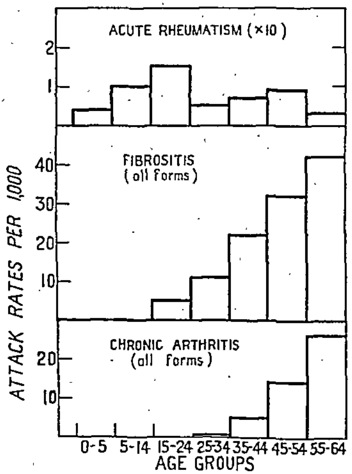
‡ Details to be found Report 235, p. 15.

menopause or pre-senile period are connected with the endocrine changes associated with those epochs."

INCIDENCE OF NON-ARTICULAR RHEUMATISM.

I shall now briefly estimate the incidence of the group of non-articular rheumatic diseases, muscular rheumatism, lumbago, and sciatica and brachial neuritis. That they are very common is a matter of common knowledge, and indeed as regards the numbers of patients they are diagnosed in nearly two-thirds of all male rheumatic patients and more than half of all female rheumatic patients.

FIG. 4.



Attack-rates from acute rheumatism (×10 scale), fibrositis and chronic arthritis among insured males of various age-groups.

Table IV. gives the approximate annual attack-rates for the four diseases found in the Ministry's inquiry for insured persons. Here we shall again see that whilst the male rates are probably fairly representative of males in England and Wales, the female rates are much less representative of the female population as a whole.

TABLE IV.—*Annual Attack-rate per 1000 Insured Persons in each Age-group.*

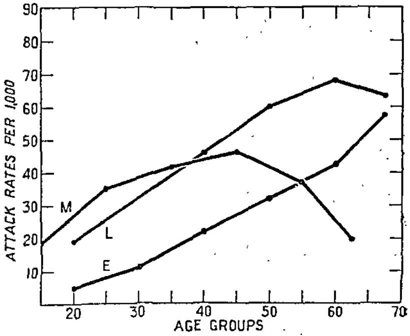
	Age-group—					All ages.
	16 to 24	25 to 34	35 to 44	45 to 54	55 to 64	
			Muscular rheumatism.			
Men ..	3	4	7	9	11	6
Women ..	4	6	10	16	18	7
			Lumbago.			
Men ..	2	6	12	18	22	10
Women ..	1	2	4	11	12	3
			Sciatica.			
Men ..	0·4	1·2	2	4	6	2·4
Women ..	0·4	0·3	1	1	5	0·6
			Brachial neuritis.			
Men ..	0·06	0·06	0·5	1	2	0·5
Women ..	0·3	0·5	1·5	4	1	0·8

Several points of interest emerge. Contrary to the opinion of many authorities who say that the disease is more (three times as) common in men, the female attack-rate for muscular rheumatism is at all ages higher than the male rate. Lumbago, however, upholds the ordinary view, the male attack-rate being far greater at all ages than the female. In the youngest group it is double, in the 25–34 group exactly three times, in the 35–44 group three times as great as the female, over middle age it is nearly twice the female attack-rate.

For sciatica and brachial neuritis together the male attack-rate is generally substantially higher than the female, the difference being entirely due to the male liability to sciatica. Later on it will be seen that in brachial neuritis the female attack-rate is much higher than the male up to 55, after which there is an increase in the male rate. It may be *observed here that for sciatica alone the ratio of male* to female cases as expressed by the attack-rates for all ages 2·4 per 1000 males to 0·6 per 1000 females, is almost exactly the 4 to 1 ratio given by Gowers,[20] which, he adds, forms a remarkable contrast to the analogous affection of the arm. For the latter, the attack-rate for males of all ages proved to stand to the female attack-rate as 0·5 to 0·8 per 1000, or very nearly as 2 is to 3.

To see how heavy an incidence these attack-rates really represent, let us suppose they apply equally to all men and women of corresponding age in England and Wales instead of applying only to insured persons.

FIG. 5.



Non-articular rheumatic diseases. Attack-rates in Moscow 1928 (M), Leipzig 1887–1907 (L), and England 1922 (E), insured males.

There are some 12,752,000 males and some 14,171,000 females in England and Wales between the ages of 15 and 65—what may be called the working half century of life. If we divide them in their age-grouping as given us by the Registrar-General, and apply the insured attack-rates, we should expect to find just a quarter of a million cases of fibrositis in each sex, cases, that is, of sufficient severity to cause the patient to consult his or her medical adviser. Dividing this fibrositis morbidity into its several parts, it represents at a rough estimate that we should expect to find yearly in all England and Wales 78,000 men and 138,000 women suffering with muscular rheumatism; 131,000 men and 72,000 women with lumbago; 35,000 male cases of sciatica and brachial neuritis, and nearly 33,000 female cases of the same. Many cases would be comparatively slight and transient.

One point which should be noted is that the sex variations are well seen in the young age-groups—i.e., before the usual age of onset of osteo-arthritis, with which sciatica, and to a somewhat less extent lumbago, are so intimately connected, and before the possible endocrine influences of the menopause can have any effect. The sex- and age-incidence represented by these attack-rates can be tested in two ways, first, by comparison with the age-incidence of previous series, such as Llewellyn's[21] for the three diseases, and secondly, by comparison with foreign attack-rates from one or two sources.

The age-incidence of the cases in the Ministry's inquiry agreed well with Llewellyn's[21] series as regards male patients when both are expressed as percentages.

German and Russian Statistics.

Llewellyn's figures do not, of course, permit of any estimation of attack-rates, as the population at risk was unknown, so that a closer comparison is with foreign statistics grouped in age-groups as are our own. Only two of these appear drawn up in forms at all comparable to our own inquiry, the monumental Leipzig statistics[10] (1887 to 1907) and the recent work of Danieschewski[11] in Moscow.

The non-articular manifestation group of diseases in our inquiry afforded an interesting comparison with the muscular rheumatism category of the Leipzig statistics, as the two categories comprise almost exactly the same set of diseases. The Leipzig category had for its main heading the term "muscular rheumatism," and included also lumbago, sciatica, and "sacral pains," so that, with the possible exception of brachial neuritis, it appears exactly to correspond with our non-articular manifestation group. The Leipzig attack-rates for this group of diseases were much higher than ours for both sexes, and at every age-group, and their days of sickness per 1000 workers in every age-group (except the two oldest age-groups, where their limitation of benefit no doubt prevents this) were much in excess of ours; but up to 45 their mean length of attack was considerably less than ours.

The comparison with the Moscow morbidity (Fig. 5) shows the English rate to be much lower for males in the young age-groups, but the female rates are very similar. For some reason I do not know, the two oldest decades evidently introduce some factor rendering the figures not comparable with either ours or those of Leipzig (Fig. 5).

The comparison with these foreign statistics is not, of course, completely fair or valid owing to great differences in the methods of collection of material, but it would, perhaps, seem fair to assume that there was considerably less non-articular rheumatic disease in England and Wales in 1922 than in Leipzig in the years from 1885 to 1903, or in Moscow in 1928. Comparison with Moscow is, however, puzzling. For men of all ages the Moscow attack-rate is 28 per 1000 compared with our rate for insured men of all ages of 19 per 1000; women of all ages in Moscow show an attack-rate of 13 per 1000 compared with one for English insured women of 11 per cent. Yet at the younger ages the Moscow experience is much higher than ours, whilst for the older groups it is much lower, quite impossibly low, it seems, on medical grounds, and there probably is some non-medical factor—e.g., some condition of insurance operating here—which renders the statistics not comparable with ours, or with Leipzig, in these two older age-groups.

Seasonal Incidence.

The seasonal incidence of fibrositis corresponds generally with that of acute rheumatism having a high winter prevalence, with peaks in November and February in Europe, the November peak not being usually present in America. There is a summer minimum usually in July. In sciatica it seems that the autumn rise occurs a good month earlier than in the other rheumatic diseases.

I shall discuss the implications of this large incidence of the various forms of fibrositis together with that of arthritis in my next lecture.

REFERENCES.

1. Hirsch, A.: Handbook of Geographical Pathology, London, 1886, iii., 747.
2. Report of Local Government Board, 1912–13, p. lvii.
3. Newman, G.: Outline of Preventive Medicine, London, 1919, p. 27.

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References.

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4. Burndage, D. K.: U.S.A. Public Health Reports, 1920, xxxv., No. 53, p. 3166.
5. Incidence of Rheumatic Diseases, Min. of Health Reports on Public Health Subjects, 1924, No. 23, p. 18.
6. Chief Medical Officer's Report for 1928, p. 19.
7. Hill, A. B.: Investigation into the Sickness Experience of Printers, Industrial Fatigue Research Board Report, No. 54, 1929, pp. 59, 64, 75.
8. Op. cit.,[5] p. 35.
9. Vernon, H. M., and Rusher, A. E.: Jour. Indust. Hygiene, July, 1921, p. 95; Industrial Fatigue Research Board Report, No. 5, p. 81.
10. Statistics of Leipzig Federation of Sickness Funds, 1910.
11. Danieschewski, G.: Akuter and Chronischer Rheumatismus in der U.S.S.R., pp. 21, 22.
12. Jansen, H.: Arch. Med. Hydrology, Jan. 1st, 1926, p. 126.
13. Hale-White, W., in French's Index of Differential Diagnosis, 1917, pp. 341, 346.
14. Glover, J. A.: Ministry of Health's Reports on Public Health Subjects, No. 52, Chronic Arthritis, p. 8.
15. Strangeways, T. S. P.: Proc. Roy. Soc. Med., 1923, xvii., 12.
16. Pemberton, R.: Arthritis and Rheumatoid Conditions, 1929, p. 42.
17. Nichols, E. H., and Richardson, F. R.: Jour. Med. Research, 1909, xxi., 149.
18. Putti, V.: THE LANCET, 1927, ii., 60.
19. Llewellyn, R. L. J.: Proc. Roy. Soc. Med., 1925, xix., pt. 1, Balneology, p. 7.
20. Gowers, W. R.: Diseases of the Nervous System, London, 2nd ed., vol. i., p. 102.
21. Llewellyn, R. L. J., and Jones, A. B.: Fibrositis, London, 1915, p. 22.

DISSEMINATED SCLEROSIS.

PATHOLOGICAL AND BIOCHEMICAL CHANGES PRODUCED BY A "VIRUS" CULTIVATED FROM THE CEREBRO-SPINAL FLUID.

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SOON after the fact seemed well established by Miss Chevassut that a virus was constantly found in the cerebro-spinal fluid (C.S.F.) in disseminated sclerosis (D.S.), and that this virus was consistently absent in normal C.S. fluid and from C.S. fluids in other pathological conditions of the nervous system, it was decided to try the effect of injections of cultures of this virus into animals. At first these injections of culture were of unknown strength, but it later seemed desirable to be able to estimate the approximate strength of our cultures.

Method of Estimating Strength of Virus Suspension.

A method was devised by one of us (J. A. B. H.) as follows:—

An ordinary platinum loop is made and the loop is carefully kept, so that its volume is constant. This loop is used for removing all suspensions or drops of broth culture in the subsequent estimations. The number of drops required from this loop to make up 1 c.cm. is not a difficult problem. This is the first factor in the calculation, and it has to be worked out each time a new loop is taken into use. Slip preparations of the culture or emulsion are next made. The under slip measures 2 in. × ¾ in., and the cover slip 1½ in. × ½ in. A drop of the fluid from the standard loop is run between the cover slip and the under slip, and the two slips sealed together by means of melted paraffin wax applied around the edges by a fine camel hair brush.

One tries to so arrange one's standard loop that one drop *just* spreads out between the two slips. This is not so difficult as it may appear. Now this very thin layer between the slips represents the total volume under observation, and its proportion to 1 c.cm. is merely a matter of calculation. This is the second factor. The "slip" preparation thus made is fitted into a special carrier in order that it may be examined under the microscope.

The next factor is ascertained from the maker of the microscope, and that is the area of the field under observation as seen through an ocular fitted with a micrometer eye-piece. The area of the upper cover slip is easily estimated, and again a calculation of the ratio of this microscope field to the whole area is simple, and we have the third factor.

The average number of virus spherules per field can now be worked out by counting numerous fields and taking an average:—

Supposing—
A. = Total area of top cover slip.
AF. = Area of field under observation.
S. = Average number of "spherules" per field.
L. = Number of standard loops per c.cm.
LC. = Number of loops required to just flow under the top slip (usually one).

Then the calculation is:—

$$\frac{A.}{AF.} \times S. \times \frac{L.}{LC.} = \text{Number of virus "spherules" per c.cm.}$$

The obvious sources of error in this method at once occur to any laboratory worker, but the method is probably more accurate than some of the present methods employed to estimate the strength of bacterial emulsions. At any rate it was found possible for different workers to obtain similar results with the same virus "spherule" suspension.

This method was constantly used by Miss Chevassut in the preparation of the vaccines for patients suffering from disseminated sclerosis, but after a while we did not estimate exactly the strength of the suspension injected into animals, it being found that 5 c.cm. of a young broth culture produced no ill-effects when injected intravenously.

It was found that treatment of the culture of the virus with a 0·5 per cent. carbol-saline solution killed the virus, and this was the method of sterilising our vaccine suspensions. It was found that as regards animals, untreated cultures of the virus had no apparent immediate effect, whether given subcutaneously or intravenously, and that killed virus suspensions could be given intravenously to patients with safety. The doses used and the clinical results obtained from vaccines prepared in the laboratory are described in Sir James Purves-Stewart's paper (THE LANCET, March 15th).

Some Serological Observations. (J. A. B. H.)

It was quickly realised that fresh human serum was the ideal medium for the enrichment of the Hartley's broth used in the cultivation of the virus, and to the numerous self-sacrificing students and other workers who were bled pretty freely for the benefit of the research, we owe a debt of gratitude, for it was essential to have a good supply of human serum to obtain good results. Horse, goat, and to a slight extent rabbit's serum, though not actually inhibitory gave slower development and less luxuriant growth of the virus.

It had been ascertained (Miss Chevassut) that the serum of certain patients suffering from disseminated sclerosis subsequent to vaccine treatment proved inhibitory to the growth of the virus in culture, and for that reason some hopes were entertained of producing antibodies in animals. Thus while observations were proceeding on the effects of injections of the killed virus suspension (vaccine) into patients suffering from disseminated sclerosis attempts were made by one of us (J. A. B. H.) to ascertain if an antiserum could be prepared, and further, to see if any sort of antibody could be demonstrated by such procedure as the fixation of complement.

The rabbit was chosen for the initial experiments, and 5 c.cm. of the culture in Hartley's broth and human serum was given each time, while the control rabbit received only Hartley's broth and human serum. Some of the rabbits showed signs of collapse lasting 1–3 hours, but on the whole they were but little affected and maintained a good weight and coat throughout. They were bled at certain intervals under sterile conditions, and their serum tested against cultures of the virus.

Rabbit A received the culture every two days for five weeks, and the serum was then found to have become inhibitory to cultures of the virus. This rabbit was kept alive in order to see how long any inhibitory property lasted. Unfortunately, after it had been kept three months it developed a palsy, which at a subsequent post-mortem was found to be due to a spinal tumour, which it is hoped to describe in a subsequent paper.

Rabbit B received an injection of the culture every four days for five weeks, and the serum in this case was found to be inhibitory when tested at five weeks and again six months later.

Rabbit D received an injection every seven days for nine weeks, and was found to have become inhibitory and to remain so six months later.

Rabbit E also received an injection every seven days, and was found to be practically inhibitory after one week, and completely so in two weeks. Injections were continued in this rabbit, but it unfortunately died from acute pulmonary congestion.

Rabbit C received only Hartley's broth and serum every two days for five weeks, and no inhibitory substance developed in the serum of this control rabbit.

It thus appeared from our observations that it was possible to detect inhibitory substances in certain patients who were suffering from disseminated sclerosis, and to be able to produce inhibitory substances in rabbits in about 2–5 weeks by the injection of cultures of the virus, or in patients by the injection of vaccines.

Some of the monkeys used in the experiments to be shortly described were also bled after they had received intravenous injections, but their serum proved to be possessed of no inhibitory properties.

Some preliminary experiments were next made by one of us (J. A. B. H.) on the sera of Rabbits B and D to see if any fixation of complement occurred, but the results were negative. Later the sera of 12 patients suffering from disseminated sclerosis were similarly tested and again the results were negative.

The method used for the test was Method 4 of the Medical Research Committee's Report No. 14, with minor modifications.

Two antigens were used in these experiments, one being made up of five different cultures of the spherule, and the other from three different cultures. The antigens (broth cultures) could be used in 1/2 dilutions, and the tests were "incubated" by various ways. Being unaware as to whether the hypothetical antibody was thermo-stabile or not, the complement in the human serum was got rid of by keeping the serum for a week. The sera were divided into two halves, one series being incubated at room temperature for half an hour, followed by half an hour in the water-bath at 37° C. The other series were placed in the ice-box for 24 hours. Six sera were incubated in the ice-box for 48 hours.

All the results were negative.

Experiments on Monkeys. (By Sir J. P.-S. and J. A. B. H.)

It seemed desirable to endeavour to produce the lesions of disseminated sclerosis in animals, and monkeys were selected as most suitable for these experiments. It was determined to give cisternal and intravenous injections of broth cultures of the virus. Sir James Purves-Stewart was responsible for the intracisternal injections, while the remainder of the work was undertaken by J. A. B. H. and the laboratory staff as a whole.

It was decided to give some of the monkeys only intravenous injections, some only intracisternal and some injections of broth cultures of the virus by both routes. The intervals were chosen so that some monkeys received a single injection, while others had repeated injections of broth cultures of the virus. The injections had necessarily to be given under an anæsthetic, and the anæsthetic that disturbed the monkeys least was found to be an A.C.E. mixture. One or two of our monkeys had an anæsthetic at weekly intervals without apparently suffering any ill-effects. In only two instances did we have any anxiety after the termination of the operation for intracisternal puncture, and in most instances the monkeys were munching an apple within half an hour of the puncture being completed. The anæsthetic was given in a chamber slightly modified from the pattern employed by Prof. Voronoff in his rejuvenation experiments.[1] This permits the animal to be anæsthetised very quietly, under full observation. Indeed, they merely salivate and then topple over sleepily, when anæsthesia can be continued on a warmed table. We kept our animals wrapped up in blankets while recovering from the anæsthetic, and always in front of a fire. The monkeys never experienced the slightest respiratory trouble, though we were working through the very cold weather of early 1929.

FIG. 1.

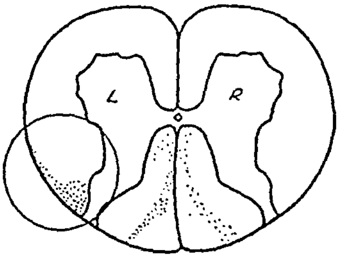


FIG. 3.

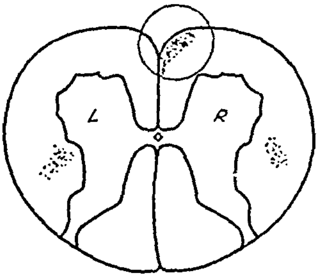


FIG. 5.

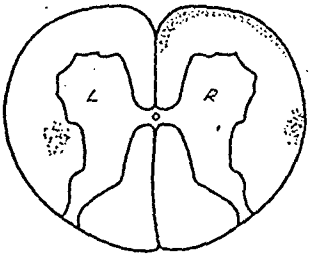


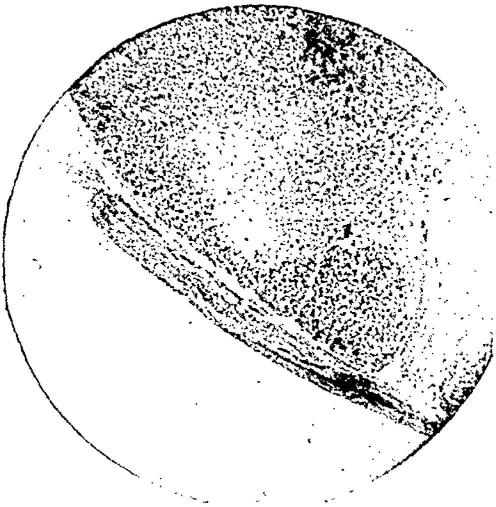
FIG. 1 (Monkey 4).—Degeneration in cervical region (Marchi method). The part outlined in a circle is seen in Fig 2.

FIG. 3 (Monkey 5).—Degeneration in lumbar cord. The part outlined in a circle is seen in Fig. 4.

FIG. 5 (Monkey 5).—Degeneration in dorsal cord.

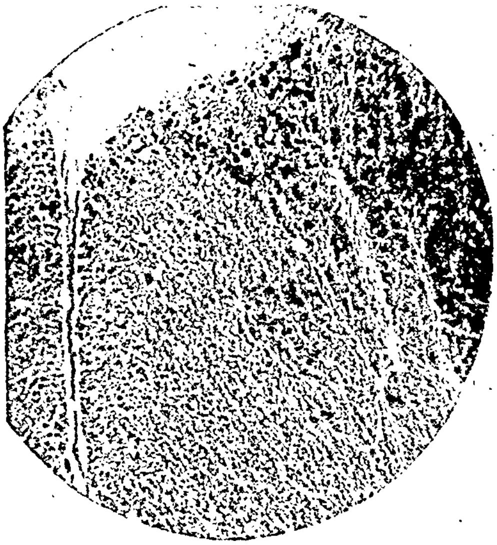
We lost one monkey during the operation of cisternal puncture, and one monkey (Monkey 7) from acute gastro-enteritis after it had remained healthy under experiment for many months. With the exception of Monkey 4 (to be described later) all the rest remained lively and in good health and coat, especially one fed on daily rations of whisky (Monkey 2). We gave this monkey whisky in an attempt to damage the antitoxic functions of the liver, since it had been found (Miss K. Chevassut) that this function was defective in patients suffering from disseminated sclerosis. However, when this animal was investigated, the liver was found histologically unaltered.

FIG. 2.



Monkey 4.—Photomicrograph of portion within circle in Fig. 1. (× 60.)

FIG. 4.



Monkey 5.—Photomicrograph of portion within circle in Fig. 3. (× 60.)

The spinal cords were examined by various methods, most of the cords being treated by Marchi and Weigert-Pal methods and embedded in celloidin. Some were also embedded in paraffin and stained by hæmatoxylin and eosin, and some also frozen and treated by Scharlach R. My senior technical assistant (Mr. F. R. Chopping) obtained some promising results from frozen sections and a modification of Marchi's method.

Below is shown a brief account of our experiments and the histological findings.

Monkey 1.—A single intravenous injection of 5 c.cm. cerebro-spinal fluid from a case of disseminated sclerosis. The cisternal fluid of the monkey was examined one month and six months later. Cultures found negative on both occasions. Eighteen months after the original injection, 5 c.cm. of a broth culture of the virus was given intravenously. Monkey killed six months after this intravenous injection. Cultures from cisternal fluid negative. Sections of the cord showed nothing abnormal.

Monkey 2.—An intracisternal injection of cerebro-spinal fluid (2 c.cm.) only. The cisternal fluid was examined one month and six months later, and cultures were found negative on both occasions. The monkey was now put on a daily ration of whisky (℥ iis. to ℥ iv.) by mouth. Combined injections by intracisternal (2 c.cm.) and intravenous (5 c.cm.) routes were given at monthly intervals on six separate occasions. After the second of these injections the cisternal fluid was examined, and cultures from it were found to be positive for the virus and remained so at every subsequent examination. Five months after the last injection the animal was killed. The cultures from the cisternal fluid were still positive for the virus. Sections of the cord showed nothing abnormal.

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[1] Étude sur la Vieillesse et le Rajeunissement par la Greffe, Paris, 1926. (See Figs. 18 and 19.)

Monkey 3.—A single intravenous and intracisternal injection from a culture from the fluid of disseminated sclerosis was given. The cisternal fluid was examined one month and six months after and found positive for the virus on both occasions. Twelve months after the first injection the animal received a second intracisternal injection of culture, and was killed seven months later. Cultures from the cisternal fluid were negative on this occasion, though on two previous occasions they had proved positive. Bearing in mind experimental errors there also occurred to us the possibility of acquiring immunity. Sections of the cord showed nothing abnormal.

Monkey 4.—This was our most interesting animal. This monkey received a single intravenous injection of 5 c.cm. of a culture of the virus. Cultures from the cisternal fluid made at one, two, and six months intervals from this injection proved positive for the virus. About nine months after the intravenous injection a transient paresis was observed in the hind limbs. This passed off in about three weeks. The animal subsequently developed several similar attacks, each rather worse than the former until 14 months after the injection the condition became serious. The paresis had spread to the fore limbs, and was more marked on the left side than the right. The tail also was weakened, and towards the final stages the monkey could not climb on to the perch, and lay on the bottom of the cage. It took its food well, and the coat remained in good condition till it was killed to prevent further suffering. A suitable sample of cerebro-spinal fluid could not be obtained at this stage. Sections of the spinal cord stained by Marchi's method show two distinct tracts of systemic degeneration (ascending). One is situated in the left postero-median column at its junction with the postero-external, and the other is seen in the direct cerebellar tract on the left side (see Figs. 1 and 2). In some of the sections stained by hæmatoxylin and eosin there seemed to be evidence of perivascular "cuffing," but the blood-vessels themselves were unaffected. These changes were slight, but seemed to us of importance because abnormal and occurring in this monkey.

Monkey 5.—This also proved an interesting animal, since it was apparently healthy, only sections of the cord suggesting early pathological changes. This monkey received combined intracisternal and intravenous injections of broth cultures of the virus, at monthly intervals for seven months. The cisternal fluid was examined frequently and found to yield positive cultures. It was killed three months after the last injection. Sections of the spinal cord in the cervical, thoracic, and lumbar regions (Marchi method) showed well-marked and fairly compact degeneration at the periphery of the antero-medium column, together with a few scattered patches in both lateral columns (Figs. 3, 4, and 5).

Monkey 6.—Received combined intravenous and intracisternal injections of cultures of the virus and the cerebro-spinal fluid in a case of disseminated sclerosis. The cerebro-spinal fluid was examined two months and seven months later, and cultures were found positive for the virus. The animal was killed seven months after the injection. Cultures made from the cerebro-spinal fluid proved positive, but the liver and spleen were negative for the virus. Sections of the cord showed nothing of note.

Monkey 7.—This experiment was an attempt at transmission from monkey to monkey. The animal received a combined intracisternal and intravenous injections of a culture obtained from the cerebro-spinal fluid of the case Monkey 4. The spinal fluid was examined two months and four months later, and cultures proved negative. Further combined intracisternal and intravenous injections were commenced, but the animal died from an acute enteritis. The viscera were much decomposed as death occurred over the week-end and the cord proved valueless for histological examination.

The only results in any way positive as regards histological changes in the spinal cord were those found in Monkeys 4 and 5. Monkey 4 had definite clinical symptoms, but Monkey 5 had nothing apparently the matter with it when killed. The cords were removed carefully, so that precautions were taken to avoid the changes due to artefacts.

As regards Monkey 4, the question of cage paralysis must be carefully considered, in spite of the fact that all our animals were quite lively and apparently in good health and coat. The degenerations appear to be definitely systemic in character, but there does not appear to be any reference available as to the changes found in the cord in cage palsy, so that one is unable to make any comparison.

One of us (J. A. B. H.) is convinced that the best way to pursue further investigations will probably be by the injections of cultures intravenously, and by single or perhaps two large injections, rather than by repeated injections of small doses. Some of the effects of "vaccines" on human cases do suggest some possible immunity though animal experiments as far as the sera of monkeys were concerned were negative.

Summary.

1. A method has been devised for estimating the strength of the suspension of the virus isolated from disseminated sclerosis.

2. This virus is readily killed with carbol-saline, and suspensions of it can be used as experimental vaccines, and administered intravenously without harm.

3. There is some evidence that after the administration of a virus suspension to patients and to rabbits, inhibitory substances are formed in their sera. There is no similar evidence in the case of monkeys.

4. No complement-fixation phenomena can be observed in patients who have disseminated sclerosis or who have had vaccines administered. The sera of virus injected rabbits also show no complement fixation.

5. No immediate harm results from the injection of large doses of the unkilled virus, but in two monkeys certain systemic tract degenerations have been detected in the cord some ten months later. It is not claimed that these lesions are disseminated sclerosis but their presence is suggestive.

6. It seems highly probable that the best experimental results will be obtained by the intravenous route.

BIOCHEMICAL OBSERVATIONS UPON MYELIN DEGENERATION.

By F. D. M. Hocking.

As one of the characteristic lesions in disseminated sclerosis consists in a degeneration of the medullary sheath with a splitting off of unsaturated acids of the oleic acid series staining black with osmic acid, it was thought desirable to inquire whether the virus described by Miss Chevassut was capable of splitting the lipoids of nervous tissue in vitro. To this end it was decided to attempt to prepare a physically stable emulsion of brain lipoids in human serum and Hartley's broth, and to incubate this fatty medium together with a culture of the virus. It was anticipated that any action which might occur would probably be of the nature of a splitting off either of free fatty acids, or of phosphoric acid, evidence of which would be obtained by a change in the hydrogen-ion concentration of the mixture, corresponding to the amount of acid liberated.

The hydrogen electrode used was of the Rideal pattern, in conjunction with a calomel electrode of ordinary type, a potentiometer and a galvanometer. The instrument was found to be accurate and sensitive to a reading of 2 millivolts.

The lipoid material required for these observations was extracted from a fresh brain obtained post mortem from a case in which there was no possible suspicion of any central nervous disease. The whole brain was finely minced and dried by intimately mixing with three times its weight of plaster-of-Paris. The result was to produce a hard, stony mass which, after being ground to a fine powder was extracted successively with absolute alcohol, ether, acetone, and chloroform, four litres of each solvent being used. These solvents were subsequently removed from the dissolved fat by distillation under reduced pressure in a stream of dry carbon dioxide. The temperature of the heating bath was never allowed to exceed 40° C. All the extracts thus obtained were mixed together, the total yield being 64 g. of a pale yellow (almost white) coarsely crystalline, dry fat. A 2 per cent. solution of this fat was then prepared in a mixture of acetone and ether, so adjusted that no constituent of the fatty mixture remained undissolved. It was found that the whole of the lipoid material could then be brought satisfactorily into solution. When added to Hartley's broth, the fat from this solution separates out into a fine suspension which remains stable for three weeks or longer, and which, moreover, does not tend to separate even on boiling.

TABLE I.—*pH of Cultures of Cerebro-spinal Fluid, Hartley's Broth, and Serum.*

Day	1	2	3	4	5	8	9	10	11	12	13	14
Tabes	7·7	7·7	7·65	7·7	7·68	7·7	7·71	7·68	7·7	7·7	7·68	7·7
G.P.I.	7·6	7·6	7·55	7·6	7·6	7·55	7·6	7·67	7·6	—	7·6	—
Tabes	7·5	7·5	7·52	7·6	7·55	7·45	7·5	—	—	—	—	—
Hysteria	7·5	7·5	7·51	7·52	7·48	Contaminated.						
Normal C.S.F.	7·6	7·6	7·61	7·6	7·55	7·6	7·62	7·58	7·6	7·6	—	—
Broth and serum only ..	7·6	7·55	7·6	7·6	7·62	7·6	7·6	7·6	—	—	—	—

TABLE II.—*pH of Cultures of Cerebro-spinal Fluid, Hartley's Broth, Fat, and Blood Serum.*

The cases were the same as those recorded above.

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Tabes	7·68	7·7	7·7	—	—	7·65	—	7·65	—	7·7	—	Contaminated.		
G.P.I.	7·7	—	7·7	—	7·64	—	7·7	—	7·75	—	7·7	—	7·7	—
Tabes	7·6	7·65	—	7·6	—	7·6	—	7·6	—	—	—	7·7	—	—
Hysteria	7·7	7·7	7·65	—	7·72	—	7·7	—	7·7	—	—	7·68	—	—
Normal C.S.F.	7·6	—	—	7·65	—	—	7·6	—	—	7·6	—	—	7·6	—
Broth, fat, and serum only	7·6	7·6	7·55	7·58	7·6.	7·6	7·58	7·6	7·6	7·61	7·58	—	—	—

TABLE III.—*pH of Cultures of the Virus in Hartley's Broth and Blood Serum.*

Day ..	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Case 1 ..	7·6	7·6	7·5	7·4	7·05	6·88	6·85	6·99	7·1	7·22	7·4	7·5	7·5	—
,, 2 ..	7·6	7·3	6·85	—	6·79	6·9	7·1	7·25	7·5	7·8	8·0	8·0	—	—
,, 3 ..	7·5	7·45	7·1	6·9	7·01	7·25	7·6	7·7	7·8	—	8·0	8·2	8·2	—
,, 4 ..	7·6	7·6	7·5	7·3	7·1	7·0	7·2	7·6	7·85	7·85	8·0	8·1	8·1	—
,, 5 ..	7·6	7·6	7·5	7·4	7·2	7·0	7·0	7·1	7·4	7·6	7·7	7·8	7·8	7·8
,, 6 ..	7·6	7·5	7·3	7·1	6·95	7·15	7·2	7·35	7·5	7·7	7·9	8·0	8·1	8·2
,, 7 ..	7·6	7·6	7·35	7·1	6·88	6·85	7·1	7·2	7·4	7·5	7·5	7·5	—	—
,, 8 ..	7·6	7·55	7·4	7·2	7·05	7·2	7·4	7·4	7·5	7·7	7·9	8·1	8·2	8·2

TABLE IV.—*Amino-acid Content (mg. per 100 c.cm.), pH, and Free Ammonia Content (mg. per 100 c.cm.) of Cultures of the Virus in Hartley's Broth and Serum.*

—	Day ..	1	2	3	4	5	6	7	8	9	10	11
1	pH	7·6	7·6	7·5	7·3	7·1	6·95	—	7·3	7·5	7·5	7·6
	Amino-acids ..	14·0	14·7	16·3	17·7	18·7	19·1	—	19·9	20·2	20·3	20·2
	Ammonia ..	21	30	27·1	23·8	22·5	23·5	—	27·6	30	31	31
2	pH	7·6	7·5	7·45	7·2	7·05	7·3	—	7·5	7·6	7·6	7·6
	Amino-acids ..	13·4	14·0	14·7	15·5	16·1	16·6	—	17·7	18·4	19·1	19·8
	Ammonia ..	30	21	20·2	25·5	30·1	30·7	—	32·5	36·0	37·1	38·0
3	pH	7·6	7·6	7·5	7·3	6·95	7·1	—	7·2	7·3	7·3	—
	Amino-acids ..	13·6	14·1	14·8	15·4	15·9	16·5	—	17·3	18·4	19·2	—
	Ammonia ..	28	26	22	24	21	30	—	33	36	32	—
4	pH	7·6	7·55	7·3	7·1	7·05	7·2	—	7·5	7·65	7·7	7·7
	Amino-acids ..	14·1	14·7	15·2	15·9	16·2	16·6	16·9	17·4	17·8	18·3	19·1
	Ammonia ..	22	24	21	19·6	23	27	—	31	38·1	42·5	46·3
	pH	7·6	7·6	7·6	7·4	7·3	7·3	7·2	Culture dead			
	Amino-acids ..	14·5	15·1	15·3	15·6	15·7	15·5	15·6	,, ,,			
	Ammonia ..	27	21	23	24	28	28	27	,, ,,			

TABLE V.—*pH Value of the Fat Emulsion after Inoculation with the Virus.*

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Culture No. 1 ..	7·25	7·11	7·18	—	7·6	7·65	7·70	7·83	7·88	7·91	—	7·92	7·92	7·89
,, ,, 2 ..	7·31	7·28	7·31	—	7·62	7·71	7·82	7·83	7·86	7·89	—	7·92	7·93	7·90
,, ,, 3 ..	7·31	7·25	7·30	—	7·7	7·81	7·85	7·83	7·87	7·91	—	7·93	7·93	7·93
,, ,, 4 ..	7·38	7·30	7·40	—	7·65	7·73	7·82	7·83	7·88	7·91	—	7·91	7·91	7·91
,, ,, 5 ..	7·38	7·35	7·36	—	7·48	7·53	7·55	7·70	7·85	7·93	—	7·99	8·03	8·03
,, ,, 6 ..	7·35	7·27	7·35	—	7·55	7·59	7·62	7·68	7·79	7·82	—	7·88	7·88	7·90
,, ,, 7 ..	7·31	7·20	7·21	—	7·75	7·77	7·80	7·83	7·88	7·91	—	7·98	8·02	8·02
,, ,, 8 ..	7·35	7·15	7·35	—	7·55	7·61	7·67	7·78	7·84	7·88	—	7·94	7·94	7·90
,, ,, 9 ..	7·31	7·28	—	7·41	7·60	—	7·70	—	7·90	—	7·97	8·05	—	8·03
,, ,, 10 ..	7·34	7·30	—	7·48	7·68	—	7·78	—	7·95	—	7·99	8·07	—	8·07
,, ,, 11 ..	7·38	7·30	—	7·49	7·65	—	7·78	—	7·93	—	8·01	8·07	—	8·07
,, ,, 12 ..	7·40	7·29	—	7·51	7·71	—	7·82	—	7·97	—	8·04	8·11	—	8·09
Control	7·3	7·31	7·31	—	7·35	7·37	7·37	7·39	7·38	7·40	7·40	7·39	7·41	7·41

TABLE VI.—*pH Values of the Fat Emulsion after Inoculation with Cultures Previously Grown in a Similar Medium.*

Day	1	2	3	4	5	6	8	9	10	11	12	13	14	15
Culture No. 1 ..	7·31	7·28	7·31	7·45	7·60	7·71	7·83	7·84	7·83	7·85	7·83	—	—	7·83
,, ,, 2 ..	7·34	7·34	7·35	7·37	7·36	7·35	Culture dead							
,, ,, 3 ..	7·36	7·35	7·38	7·41	7·62	7·62	7·60	7·60	7·63	Culture dead				
,, ,, 4 ..	7·38	7·30	7·40	7·55	7·65	7·72	7·81	7·87	7·91	7·95	8·01	—	—	8·01
,, ,, 5 ..	7·35	7·25	7·37	7·44	—	7·55	7·67	—	7·81	7·83	7·82	—	—	7·81
,, ,, 6 ..	7·38	7·35	7·41	7·48	7·60	7·73	7·92	7·97	8·01	8·03	8·01	—	—	8·01
,, ,, 7 ..	7·34	—	7·38	7·45	7·59	7·63	7·82	7·83	7·82	7·82	Culture dead			
,, ,, 8 ..	7·35	—	7·41	7·48	7·62	7·73	7·85	7·92	7·97	8·01	8·03	—	—	8·02
Control	7·3	7·31	7·30	7·31	7·32	7·35	7·37	7·35	7·36	7·35	7·37	—	—	7·41

The preparation which yielded the optimum concentration of fat for this work proved to be an emulsion prepared by the addition of 10 c.cm. of the fat solution to 90 c.cm. of Hartley's broth, an adequate amount of human blood serum—approximately one-third of the total volume—being subsequently added after the fat solvents had been removed. The ether and acetone were removed by heating the mixture to 50° C. for 30 minutes with constant and fairly violent shaking of the fluid. This method was found to be efficient, no stream of neutral gas being required.

It was necessary first of all to find out whether or not the organism would grow in this fatty medium. Cultures were therefore made and examined daily, when it was seen that the spherules grew and multiplied in a normal manner. In the microscopical field it was easy to pick out the spherules from the highly refractile fat droplets although many of these were less than 0·2 μ in diameter.

Before proceeding to the experiment proper it was necessary for comparative purposes to perform a number of control tests with cerebro-spinal fluid and cultures from other diseases. In the first series of experiments, cerebro-spinal fluids from a number of cases of organic nervous disease other than disseminated sclerosis were incubated with Hartley's broth both alone and after the addition of the brain fat. The hydrogen-ion concentration was determined daily, and in all cases was found to remain constant within the limits of experimental error. The actual results obtained in a number of the cases is shown in Tables I. and II.

A second series of cultures was then prepared, consisting of a broth culture of the virus of disseminated sclerosis, in Hartley's broth, and blood serum only. The results showed a progressive increase in acidity during the first four to six days, followed by a gradual return to the original level; in a few cases a more alkaline reaction was ultimately attained. These results are shown in Table III.

These results at first were somewhat disconcerting as they showed a change in reaction which it was anticipated would occur only after the addition of fat. It therefore became necessary to investigate the cause of this acid formation and its subsequent neutralisation. Three sources of acid formation are possible, viz:—

1. From carbohydrates present in the broth, serum, or cerebro-spinal fluid;
2. From the neutral fats present in the blood serum added to the cultures; and
3. From the breaking down of proteins and polypeptides into simpler compounds or substances, particularly the amino-acids.

The amount of sugar present in Hartley's broth, even after the addition of serum and cerebro-spinal fluid, was found in a series of cases never to exceed 0·01 per cent., and in most cases was either far below this level or present in such minute amounts as to be impossible of detection by such tests as the formation of osazones and copper reduction. In reality a little consideration will show that any sugar originally present in the meat from which the broth has been prepared is completely destroyed during the fermentative process of manufacture. It has further been shown that sugar disappears spontaneously from normal blood serum on keeping, owing to the presence of a glycolytic enzyme. Incidentally, Miss Chevassut has previously shown[2] that a similar enzyme is also present in cerebro-spinal fluid. The serum used in all these experiments was kept for a sufficient time before use to eliminate the possibility of any sugar entering the cultures, so that carbohydrates as a source of acid formation are improbable. With regard to the suggestion made by A. I. Kendall[3] that sugars may be split off from glucoproteins, these substances are in the first place almost completely hydrolysed during the preparation of the broth, the sugar being subsequently destroyed, and they exist in only very small amounts in blood serum. As a final test, however, inoculation of a mixture of Hartley's broth and serum with cultures of *Bacillus coli* failed to produce any gas in 14 days. Finally, any acidity due to accumulation of free CO_2 has been purposely eliminated by employing a stream of pure hydrogen in the electrode.

The possibility that the increase in acidity is due to hydrolysis of neutral fats present in the broth or serum was eliminated by a direct determination of the total ethereal extract and its acid value, both before and after incubation for ten days with a broth culture of the spherule. The total ethereal extract was found to average 0·082 per cent., with a negligible acid value, so small indeed as to be incapable of accurate determination. The same was found to be the case after incubation, so that free fatty acid formation as a cause of the acidity is also highly improbable.

There remains the possibility that the observed increase in acidity may be due to a process of hydrolysis of protein and polypeptides into amino-acids, and that the subsequent neutralisation may be due to a further disintegration of these bodies whereby ammonia is liberated. That this in fact is the probable explanation of the changes observed may be inferred from the results of a determination of the amino-acid content, the hydrogen-ion concentration, and the ammonia in a number of cases, shown in Table IV.

It will be observed that there is a progressive and approximately uniform increase in the amount of amino-acids present, sufficient indeed to account for the change in reaction in the medium. We are therefore justified in assuming that the observed increase in acidity is the result of a breakdown of protein by the virus.

It is more difficult to explain the erratic results obtained for the ammonia content, particularly the decrease which occurs during the first part of the experiment, which will, of course, account for some of the acid production. That this decrease is not due to actual loss of ammonia is shown by the fact that a series of determinations of free amino ($-NH_2$) groups in the culture medium yielded practically identical

TABLE VII.

—	Day	1	2	3	4	5	8	9	10	11
1	pH	7·4	—	7·41	7·49	7·61	7·78	7·81	7·90	7·95
	Amino-acids	14·0	14·3	14·7	15·3	16·1	17·1	17·7	18·1	18·5
	Ammonia	20	23	24	22	22	25	28	29	31
2	pH	7·38	7·30	7·40	7·55	7·65	7·81	7·87	7·91	7·95
	Amino-acids	14·0	14·4	14·8	15·6	16·5	18·2	19·2	20·0	20·6
	Ammonia	18	15	15	17	14	20	21	22	22
3	pH	7·31	7·28	7·31	7·49	7·62	7·83	7·87	7·91	7·93
	Amino-acids	14·2	14·6	14·9	15·3	16·2	17·4	17·8	18·3	19·1
	Ammonia	20	22	17	14	13	21	23	29	33
4	pH	7·41	7·29	—	7·51	7·71	7·97	8·04	8·11	8·09
	Amino-acids	14·1	14·4	14·8	15·3	16·3	17·8	18·2	18·9	19·4
	Ammonia	24	19	22	25	27·3	29	31	35	38

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[2] Quart. Jour. Med., 1927, xxi., 91.

[3] Jour. Biol. Chem., 1912, xii., 215.

results both before and during the course of incubation. We must therefore tentatively infer that some process of recombination of ammonia with hydroxy-acids occurs. This may possibly be associated with some special stage in the life-history of the organism.

Having established that the virus will grow in this fatty suspension, and having obtained for comparative purposes characteristic curves of the normal changes produced as a result of its propagation, daily pH determinations were carried out on a series of cultures inoculated into the fatty emulsion. It was anticipated that there would be a gradual and progressive increase in acidity in addition to that produced as a result of protein breakdown. The actual results obtained, which are precisely opposed to those expected, are shown in Table V.

It will thus be observed that after a short period (24–48 hours), during which there is a slight tendency to increase acid formation, there is a progressive *diminution* in acidity towards an approximately constant value. In order to determine whether or not, at the level thus obtained, the virus had actually been killed off or was only inhibited in its further development, the cultures used in the above experiment were reinoculated into the fat emulsion, the daily pH values being determined as before, with the results shown in Table VI.

Many of the cultures, therefore, retained their vitality after growing for 14 days in the fat, and were still capable of reproducing the same results obtained as when first inoculated into fat.

Estimations of amino-acid production in the fatty medium, to compare with those in which no fat was used, were then undertaken for comparative purposes, and the results are shown in Table VII.

In spite of an increase in the amount of amino-acids present, there is a progressive diminution in hydrogen-ion concentration of the cultures. This cannot be accounted for by an increase in the ammonia content which is approximately the same as before. The only other likely possibility is that it is not the free fatty acids which are primarily split off from the fatty molecule, but the nitrogenous base choline. If this is so, it amply corroborates the observations of Halliburton and others that choline can be demonstrated in the cerebro-spinal fluid in lesions associated with nervous disintegration. An attempt to isolate from cultures the free base in the form of its platino-chloride has, so far, given inconclusive results, possibly because it is still bound to a larger molecule by linkages which do not involve either its amine or hydroxyl groups.

A determination of the acid value of the ethereal extract from the fatty medium, both before and after incubation with the virus, gave results which do not suggest that any splitting off of free fatty acids occurs as a result of metabolic activities on the part of the virus.

The conclusion which may legitimately be drawn from these investigations appears to be that cerebro-spinal fluids containing this particular virus exert a specific hydrolytic action not only upon proteins and their disintegration products, but also upon the fatty constituents which occur in nervous tissues. A substance is split off from the latter in vitro, which can be detected in these fluids when organic degenerations of the nervous system are present.

In conclusion, we wish to thank the various members of our technical staff for their invaluable assistance, and we mention by name Mr. F. R. Chopping, our senior technical assistant, and Messrs. W. Lewington, F. Wilson, and A. Morris.

HOSPITAL ALMONERS.—The annual report of the Institute of Hospital Almoners records a considerable increase in the number of trained almoners in the service of hospitals. The number of students in training also shows an increase.

SMALL-POX AND VACCINATION IN THE LIGHT OF MODERN KNOWLEDGE.*

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THE most important features of small-pox which have been noted in recent years are the changes in age incidence and in virulence of the disease and the problems which have arisen in relation to vaccination.

Change in Virulence and Age Incidence.

According to Creighton (1894) in his great classic, "The History of Epidemics in Great Britain," the earliest authenticated references in Europe to small-pox appear only in the sixteenth century. The disease was well known before this to the Arab physicians; for Rhazes's treatise, the first book on small-pox, appeared in the tenth century. But it was not till the reign of James I. that small-pox began to be recognised as a killing disease in Britain. Before this it had undoubtedly been mixed up with measles, and in Elizabethan times the word "variola" was mostly applied to measles. Up to this time small-pox had been regarded as a mild disease. Thus Whitaker wrote in the middle of the seventeenth century that small-pox was "petit" and puerile and the cure "of no moment." Willis expresses much the same view, as also does Parrott, in his "Acute Diseases of Children." Undoubtedly great attention was drawn to small-pox on the death of Queen Anne from it in 1694, and it seems to have been particularly fatal to the Stuarts, since a sister and brother of Charles II. died from it in 1660.

Small-pox, therefore, came gradually into prominence and made no dramatic outburst like plague and syphilis. *In the Stuart period, and for a long time* afterwards, it produced its chief fatality among infants and children and, as it were, only incidentally affected adults. In the severe epidemic of 1783–1800 which occurred in Glasgow and which may be said to mark the highest degree of virulence, something like 90 per cent. of the deaths were in children under 5 years of age. The highest mortality at this period was over 30 per cent. Figures up to 50 per cent. however, have been recorded in certain outbreaks.

The increase in the virulence of small-pox was quite evident early in the eighteenth century and, as a result of this, the public as well as medical science were roused to combat the ravages of the infection. Thus when the protective properties of small-pox inoculation were brought to the notice of London society in 1721 people were quite ready for its adoption. To the various steps in the evolution first of inoculation and then of vaccination I shall return later.

As time went on, and specially towards the end of the nineteenth century, a change began to be noted both in the age incidence and in the virulence of the disease. The great epidemic of small-pox of 1837–40 still chiefly affected infants as formerly, but from the epidemic of 1871–72 and onwards the chief brunt of infection has been borne by young persons and adults, rather than infants and children. The virulence of the disease as judged by the case mortality showed a definite decline by the beginning of the twentieth century.

Two Types of Small-pox.

Rajchman (1928), in his authoritative paper on the Control of Small-pox, definitely states that: "The manifestations of small-pox in recent years have been characterised by (1) a very well-marked decrease in the incidence, and (2) an almost universal decrease of the case mortality." The figures, however, have been somewhat complicated by the appearance of a very mild type of small-pox known as alastrim. This mild form is believed to have appeared in this country about 1919, and since that time the number of small-pox cases (alastrim) has increased to over 2000 per annum. The general mortality from small-pox has fallen from 11·4 in 1920 to 0·3 and 0·2 at the present moment. Outbreaks of classical small-pox, with mortalities of 30 per cent. and over, have occurred in localised areas (London, 1922; in the *Tuscania* outbreak, 1929), but always from the importation of a fresh virus from abroad.

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* Abstract of an Address delivered before the Stourbridge and District Medical Society on Feb. 4th.

Apparently, it seems that there are two distinct types of small-pox and that they can exist side by side. They are, first, the classical or virulent form which is no longer endemic in this country and, secondly, the mild form of alastrim prevalent in South America, West Indies, South Africa, Australia, &c. Thus it may be said that these two forms breed true, for no good evidence has been brought to light to show that the mild form has ever given rise to the severe form of the disease. Yet experimental investigation mostly tends to show a very close relationship between the virus of alastrim and that of small-pox. Histologically, the lesions are identical; there are the same intracellular corpuscles † and bodies ‡ in the lesions while the serological tests (flocculation, complement-fixation, &c.) give similar results (Gordon, 1925, Ledingham, 1925). On the other hand, cross immunity experiments are not quite so definite and they suggest that there is a considerable antigenic difference between the viruses of vaccinia and alastrim. Thus cases of alastrim can often be successfully vaccinated after the attack, yet vaccination strongly protects against alastrim. Alastrim is a mild disease affecting, to a large extent, those in the lower ranks of life, especially undernourished. The question at present is whether the mild cases should be reported as alastrim and not as small-pox.

How, then, are we to explain this fluctuation in virulence? May it only be that true small-pox, like many epidemic disorders, shows these periodic changes of virulence, the meaning of which has given epidemiologists much room for thought? Whilst alastrim must be regarded as something apart Or it may be that the early accounts of small-pox, in the sixteenth century, really referred to the presence of alastrim, and that classical or virulent small-pox was introduced for the first time in the Stuart period.

The change in the age distribution of small-pox seems most likely to have been influenced chiefly by vaccination although other causes have been suggested, but it is difficult to determine to what extent other causes have been at work as well.

Vaccination.

There are three features of vaccination which I wish to discuss: (1) The nature or source of origin of the virus. (2) Vaccination as a general disease. (3) Nervous complications.

The Nature or Origin of Vaccine Virus.

The true nature, or rather the source of origin, of vaccine lymph has been a subject for discussion since the very inception of Jennerian vaccination, but I am afraid that the true nature of Jenner's inoculum can never be definitely decided now. Since his time, however, much has come to light which is rather against the fact that vaccinia virus (vaccine lymph) is really a true cow-pox. It was, of course, assumed in the Act of 1810 which prohibited variolation that the Jennerian vaccine was true cow-pox; in other words, it was a contagious disease of cattle and not a disease produced in cattle by the accidental inoculation of small-pox virus. Considerable support was given to the view that cow-pox was a spontaneous disease of cattle by the fact that it was extremely difficult to inoculate cattle with variolous material. We now know that this difficulty is more apparent than real, and arises from the insignificance of the primary lesion, and that small-pox can be transmitted to cattle, horses, and other animals.

Vaccination, as I have already indicated, undoubtedly arose out of a well-merited demand for some measure of protection against the frequency and virulence of small-pox and which had none of the disadvantages of small-pox inoculation. The first attempt at protection against small-pox was the inoculation of small-pox material, or as it is called, variolation. This was introduced into England in 1721, although the procedure had been practised in the East for some considerable time. The disease produced by inoculation was mostly of a very mild character, and this mild disease, of course, protected against small-pox. We all know that the introduction of small-pox inoculation has been accredited to Lady Mary Wortley Montagu, who had one child inoculated in Constantinople by the medical attendant (Maitland) at the British Embassy. After this had proved successful she had a second child inoculated in London. These successful results set the fashion and inoculation against small-pox became quite a rage amongst the wealthier classes, and even the Princess of Wales had two daughters inoculated. Though a few disquieting results checked the advance of inoculation for a time, by the year 1743, according to Creighton (1887), it had become quite a lucrative branch of medical practice. In 1746, institutes were opened in London for the carrying out of small-pox inoculation, as at the Middlesex County Hospital for small-pox in Windmill-street and at Bethnal Green. Many children were inoculated each year with only a few bad results. Such accidents as arose from time to time were the development of a severe form of the disease with occasional fatal results, whilst in one or two instances it was averred that infection had been spread by cases of inoculated small-pox.

The next advance in the process of inoculation was made by Sutton and was known as the Suttonian inoculation. His procedure was kept secret for a time, but its chief merit was that the virus was obtained from cases of inoculated small-pox, not from natural small-pox. In other words, this was an "arm-to-arm" inoculation of inoculated small-pox. It is said that Sutton and his assistant inoculated over 20,000 cases between 1764 and 1766, with practically no untoward results, and that in the year 1765 he made over £6000 profit. He claimed by his method that there was no danger of spreading infection.

It is thus evident that by the end of the eighteenth century inoculation against small-pox had, in general, been accepted as a salutary and safe procedure against the disease. With the idea of obtaining a still milder inoculum against small-pox, other procedures were attempted. These consisted mainly of attempts to make use of such natural diseases of animals as swine-pox, cow-pox, and horse-pox. Thus, in 1774 cow-pox was first inoculated into a human being by Benjamin Jesty, a farmer of Dorset, and in 1789 Jenner inoculated his own child of 8 months with swine-pox material. Both Jenner and Jesty were familiar with the popular belief which had existed in Gloucestershire for a long time, that people who had accidentally become infected with cow-pox were protected against small-pox. But it was not till 1796 that Jenner inoculated a healthy boy of 8 years with cow-pox material from the hand of a dairymaid, and a couple of months later, on inoculation with small-pox material, the boy was found to be immune. This was the only case mentioned in his original communication. Later, he carried out a similar experiment on another child with complete success. These apparently were all the experiments that Jenner did with regard to the actual protection of cow-pox inoculation against small-pox. But his original paper also contains particulars of ten instances where a supposed previous attack of cow-pox in dairy workers protected against exposure to small-pox infection. Crookshank, in his "History and Pathology of Vaccination" (1889), after reviewing Jenner's original paper, states "Such was the evidence

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† Corpuscles of Guarnerii.
‡ Paschen Bodies.

THREE NEW INSTRUMENTS FOR OBTAINING AND WORKING FASCIAL SUTURES.

By T. J. D. LANE, M.D. Dub., D.T.M. & H.,
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AND

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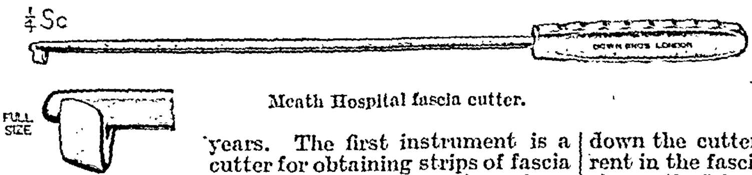
THE instruments to be described were devised at the Meath Hospital and Co. Dublin Infirmary, and have been in use in one form or other for a couple of years. The first instrument is a cutter for obtaining strips of fascia lata subcutaneously through a single small incision. The credit for first thinking of obtaining fascia lata subcutaneously and also for first very successfully putting his idea into execution belongs entirely to our colleague, Mr. Henry Stokes.

FIG. 1.



Meath Hospital fascia cutter.

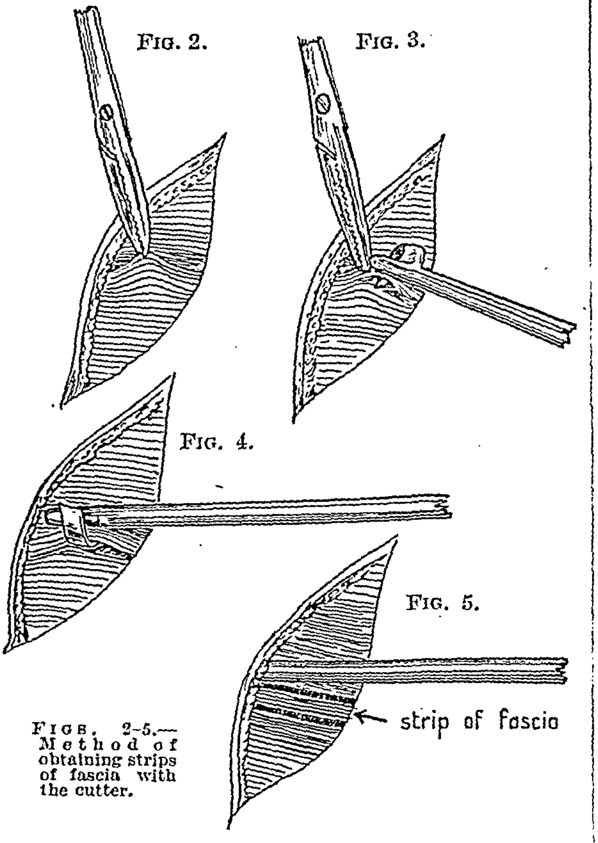


FIG. 2.

FIG. 3.

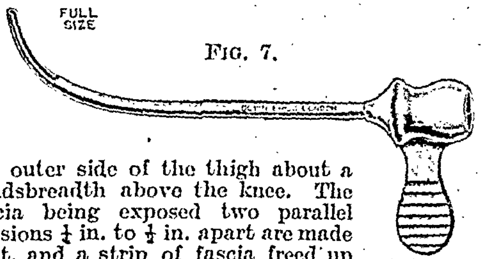
FIG. 4.

FIG. 5.

FIGS. 2–5.—Method of obtaining strips of fascia with the cutter.

Stokes's instrument consists of a short tube about ⅓ in. long by ¼ in. in diameter, mounted on a steel rod 12 in. long, which is provided with a handle at its other end. The tube is fixed parallel to the rod and is provided with a cutting edge at its distal end. To obtain the fascia lata, a short incision is made on the outer side of the thigh about a handsbreadth above the knee. The fascia being exposed two parallel incisions ¼ in. to ⅓ in. apart are made in it, and a strip of fascia freed up and snipped across at its distal end. This strip is now threaded through the tubular cutter. With the free end of the strip held by an artery forceps, the cutter is pushed subcutaneously straight up the thigh in the line of the fibres of the fascia lata. The cutter is pushed up as far as possible and is then held steady, and a small incision is made down on it. The fascia lata is exposed and the proximal end of the strip is cut free. Other strips as desired may now be cut by pulling down the cutter and starting the process again. The rent in the fascia is, of course, not sutured, and though the method has been in use for a couple of years no ill-effects have followed this omission. This instrument is made by Messrs. Smith and Shepherd, Stephen's Green, Dublin, Ireland.

FIG. 7.

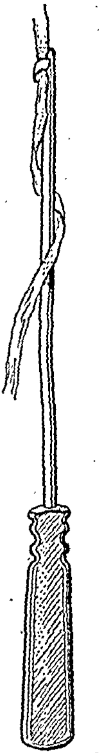


Tubular director.

We have modified Stokes's cutter, so that only one skin incision is necessary, and the introduction of the instrument into the fascia has been made almost automatic. Every member of the surgical staff of the Meath Hospital has had a hand in improving this tool, and we desire it to be known as the "Meath Hospital fascia cutter" (Fig. 1). It is, in the main, an open ring or horseshoe-shaped knife with the cutting edge on the distal end, blunt at the proximal end, fixed on the end of a 10½ in. steel stem with a good-sized handle giving a firm grip.

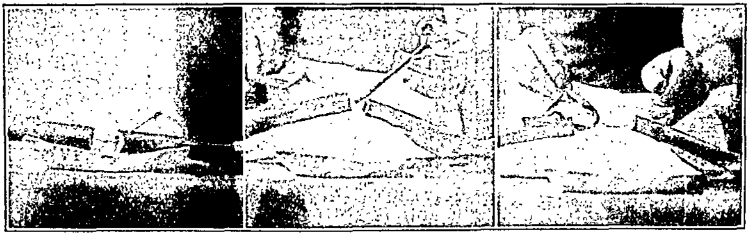
In use an incision 1 in. to 1½ in. in length is made on the outer side of the lower end of the thigh 2½ in. above the knee, and in an oblique direction from above downwards in order to expose the fascial fibres somewhat transversely. The fascia lata now laid bare is dissected free of fat, not merely at the bottom of the wound, but under its upper edge for an inch or more. It is then picked up with an Allis's forceps (Fig. 2) and the sharp free edge of the cutting hook of the knife is pushed through the base of the ridge so formed, making thereby two incisions (Fig. 3), the width of the strip of fascia between these incisions depending on the height of the ridge raised. The distal end of the strip thus made is seized with an artery forceps and *held taut*, while the hooked knife is pushed along subcutaneously in the line of the fibres of the fascia up the thigh as far as it will go (Figs. 3, 4, and 5). A rotatory movement of the instrument on the fascia strip, which is still held taut, will generally sever it from its upper connexion. Occasionally this manœuvre may fail owing to the strip falling out of the hook, in which case the knife should be withdrawn, the strip again threaded through the hook and given one twist around the shank of the instrument (Fig. 6). The knife is now advanced to the top of the strip again, the strip is held taut, and the knife is pushed obliquely upwards

FIG. 6.



Strip of fascia twisted round shank of fascia cutter.

so as to make an angle of about 20° to 30° with the strip. This brings the cutting edge of the knife across the fascial fibres and will always cut free the strip.



FIGS. 8–10.—Method of using a tubular director in suturing bone.

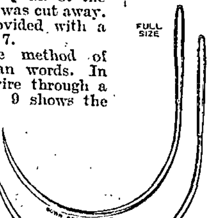
It is essential to obtain the strips of fascia from the outer side of the thigh, for here the cross fibres are practically absent and the fibres accordingly split far more easily than in front or elsewhere where the cross fibres are well developed. This also applies to Stokes's instrument. In practice we sometimes find it is better to cut several narrow strips of a convenient width for sewing rather than to cut one or two wide ones and have to split them up later. The advantage of this instrument over the former tubular type is that it is self-entering into the fascia, and that the strip can be cut at its far end subcutaneously, only one skin incision thus being necessary.

Suture of Bone and Fascia.

The next instrument is a tubular director for use in suturing bone with fascia or wire. It was made originally by adapting a curved saline needle, the point of which was ground off and then the lower ¼ in. of the concave part of the tube was cut away. In its present form provided with a handle it is shown in Fig. 7.

Figs. 8–10 show the method of employing it better than words. In Fig. 8 it is guiding a wire through a hole in the bone. Fig. 9 shows the first step in suturing a fractured bone with a strip of fascia (a bit of tape is actually doing duty for the fascia here). A loop of fine snare wire is guiding a strip of fascia through a hole in one fragment. In Fig. 10 the director is guiding the loop of snare wire through the hole in the other fragment. To facilitate the passage of the snare wire loop through the hole in the bone and in the director the ends of the loop are twisted together. This tool will be found very useful for suturing bones with fascia or wire.

FIG. 11.



Needles for suturing fascia.

We come, finally, to our fascia suturing needles. Two of these are shown in Fig. 11. We have replaced the eye of the ordinary triangular-edged muscle needle with a small flat loop of wire about 1 in. long. This needle is, of course, only an extension of Arthur's original plan of using a loop of silk. It may be threaded very easily with the aid of a fine-pointed artery forceps. The needle is not unduly heavy or wide, and is quite convenient in use.

The three instruments are obtainable from Messrs. Down Bros., of London. In their preparation we gratefully acknowledge the assistance given by the late Richard Lane Joynt, surgeon to the Meath Hospital, who made beautifully finished and improved instruments from the models we submitted to him.

Clinical and Laboratory Notes.

FŒTOR ORIS OF TONSILLAR ORIGIN AND CERTAIN BACILLI CAUSING IT.

BY ALDO CASTELLANI, HON. K.C.M.G., D.S.C.,
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HYGIENE AND TROPICAL MEDICINE.

As is well known, fœtor oris (halitosis) may be due to a variety of causes. More often than is perhaps suspected it is due to some chronic pathological condition of the tonsils, such as, for instance, granulomycosis of the crypts. In certain cases of granulomycosis a most offensive odour is emitted when the granules are extracted and squashed. The granules contain many different germs: bacilli, cocci, nocardias, monilias, spirochætes, fusiform bacilli, and sometimes even amœbæ and flagellates. In two of my cases I have isolated and grown from these granules certain bacilli which produce in agar culture exactly the same offensive odour as was noticeable in the patient's breath, and on squashing the white granules. Moreover, I have isolated these organism in four cases of fœtor oris in which the tonsils appeared normal except for some enlargement, and in two cases in which they did not even seem to be enlarged. The individuals, however, had a very offensive breath, and in making swabs from the tonsils and fauces the same two germs were grown (Bacillus I. from three cases, and Bacillus II. from the others). Of course, many other organisms were also present but none of them produced any smell in cultures. The smell is most noticeable in agar cultures kept at 35° C. for 12–24 hours. After three or four days the cultures lose the odour unless the tubes are rubber-capped, when the odour may be noticeable even after five or six days. The odour is not present, or only very slightly, in glucose agar cultures.

Bacillus I. is a motile, Gram-negative bacillus, easily stained by the usual aniline dyes. It does not liquefy gelatin or serum, it clots milk, and produces acid and gas in lactose, glucose, lævulose, maltose, galactose, saccharose, mannitol, sorbitol, raffinose, arabinose, xylose, dextrin, and glycerin. The biochemical reactions are shown in the table.

Bacillus II. is a motile, Gram-negative bacillus, easily stained by the usual aniline dyes. It does not produce gas in any sugar, it does not clot milk, and does not liquefy gelatin or serum. The biochemical characters are shown in the table.

Biochemical Reactions of Two Bacilli.
(Incubation period, 7 days.)

—	Bacillus—		—	Bacillus—	
	I.	II.		I.	II.
Motility	+	+	Sorbitol	AG	0
Gram	0	0	Inositol	0	0
Gelatin	0	0	Rhamnose ..	AG	0
Serum	0	0	Adonitol	0	0
Litmus milk ..	AC	0 Alks	Raffinose	AG	0
Lactose	AG	0	Arabinose ..	AG	0
Glucose	AG	0	Xylose	AG	0
Lævulose ..	AG	0	Dextrin	AG	0
Maltose	AG	0	Amygdalin ..	0	0
Galactose ..	AG	0	Erythritol ..	0	0
Saccharose ..	AG	0	Inulin	0	0
Mannitol ..	AG	0	Glycerol	AG	0
Dulcitol	0	0	Indol	0 or S	0
Salicin	0	0			

0 = absence of clotting in milk, absence of acidity and gas in sugar media, absence of liquefaction in serum and gelatin. A = acid. G = presence of gas. S = slight reaction.

Conclusion.

Fœtor oris of tonsillar origin does not seem to be rare. In some cases evident lesions of the tonsils are present, such as white grains in the cryptæ. In other cases no gross lesions are present, the tonsils being merely enlarged and at times apparently normal. In this type of case, swabs from the tonsils and fauces will reveal the presence of bacteria producing, when grown on agar, the same smell as that noticeable in the patient's breath. According to the classification introduced by Chalmers and myself, Bacillus I. belongs to the genus Escherichia, Bacillus II. to the genus Alkaligenes. For Bacillus I. the name *Escherichia colofœtida* (*Bacillus colofœtidus*) might be used; to Bacillus II. the name *Alkaligenes alkalofœtidus* (*Bacillus alkalofœtidus*) might be given.

I shall be pleased to supply workers interested in the subject with cultures of the two bacilli.

A CASE OF HERMAPHRODITISM.

By John Glaister, M.D. Glasg., D.Sc.,
PROFESSOR OF FORENSIC MEDICINE, THE UNIVERSITY OF EGYPT, CAIRO.

THROUGH the courtesy of Prof. Roy Dobbin, the Royal School of Medicine, Cairo, I had an opportunity of examining this interesting case which had been admitted to the Gynæcological Section of Kasr-el-Aini Hospital.

The patient was diagnosed as suffering from a Bartholin cyst and was recommended for admission to hospital. "She" had doubts as to her exact age, which was given as 18 years, and her nationality was Egyptian. Her parents had died while she was an infant and there is no history of previous illness. Menstruation had never appeared and the patient was unmarried. About ten months before admission her attention was directed to a small lump about the size of an olive stone in each of the labia, and about two months later these had commenced to swell, but remained more or less painless. The bowel and bladder function was stated to be normal and micturition was painless. The general facial appearance suggested masculinity. The eyebrows were bushy, and some hair, although not of a very coarse character, was present on the upper lip, the chin, and the upper portions of each cheek. The forearms, upper arms, lower limbs, and thighs were muscular and hairy. The hands and feet were large, the shape of the fingers being distinctly masculine. There was some prominence of the scapulæ and the base of the sacrum and pelvic outlet were narrow. The pubic arch was not wide-angled. Hair was plentiful over the upper part of the back and the base of the neck. Examination of the chest revealed the absence of female breasts, the mammary regions being definitely masculine in appearance, and there was an entire absence of female areolæ. Throughout the examination, the patient was inclined to be emotional. The pubic hair had been removed according to Egyptian custom. The labia majora were well formed and on palpation of these structures a localised mass was detected in each; the mass on the left side was about the size of a plum-stone and its margins were more definitely demarcated than that on the right side, which was rather larger, less clearly defined at the margins, and not so tense on palpation. Manipulation did not elicit complaint of pain or discomfort. The swelling on the left side could be pushed up into the inguinal canal, whereas that on the right side was only reducible with difficulty to the interior of the ring but not to the interior of the canal. Circumcision having been performed at an early age—an Egyptian custom—only a stump indicated the root of the clitoris or penis. The vaginal opening was represented by a small area covered with mucous membrane into which the urethra opened. There was no vaginal orifice but only an invagination of the mucosa which did not admit even the tip of the little finger. Rectal examination failed to reveal the presence of any internal female genital organs. A history of sexual inclination was not available. It should be noted that the voice in this case was of female type.

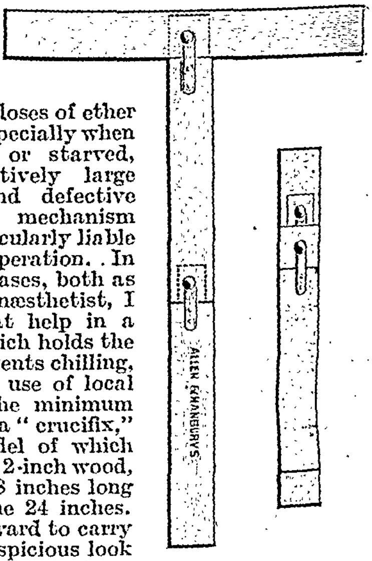
After observation in hospital it was decided not to undertake operation, and therefore a histological examination of the small labial masses was not possible to determine the absence or presence of gonads, although the absence of the majority of the secondary female characters, the male form of the body, the large bone formation, the well-developed muscles, and the growth of hair, in conjunction with andromastia, might reasonably suggest their presence.

This case is, I think, of considerable interest to the medico-legal expert, who from time to time may be called upon to express an opinion on doubtful sex cases.

New Inventions.

AN AID TO OPERATIONS ON INFANTS.

IN operating on babies there are certain special difficulties. Owing to their light weight and powers of contortion they need careful holding for greater or less time, according to the type of anæsthetic, and their small size makes it difficult for the holder to avoid the operators. They are very sensitive to overdoses of ether or chloroform, especially when they are toxic or starved, and their relatively large surface area and defective heat regulating mechanism make them particularly liable to chills during operation. In work on these cases, both as operator and anæsthetist, I have found great help in a simple device which holds the child firmly, prevents chilling, and permits the use of local anæsthesia or the minimum of general. It is a "crucifix," the original model of which was a simple T of 2-inch wood, the cross limb 18 inches long and the main one 24 inches. As this was awkward to carry and had an inauspicious look about it when taken into a private house, I devised a collapsible model in duralumin, with a sponge rubber padding, and this has been very satisfactory. The baby is wrapped in warm cotton-wool over as much of its body as possible according to the operation to be done, and is bandaged firmly to the frame. Subcutaneous salines or artificial respiration can be given without removing it. Incidentally, it is interesting to see how often a restless baby will settle down and go to sleep as soon as it is firmly fixed. It suggests that possibly there were advantages, at any rate to the parents, in the tight swaddlings which so many nations used for so many ages. The manufacturers are Messrs. Allen and Hanburys, Ltd., 48, Wigmore-street, London, W.1.



DENIS BROWNE, F.R.C.S. Eng.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF PSYCHIATRY.

AT a meeting of this Section, held in conjunction with the British Psychological Society on March 11th, the chair was taken by Sir ROBERT ARMSTRONG-JONES, President of the Section of Psychiatry. A discussion on the

RÔLE OF PSYCHOTHERAPY IN THE PSYCHOSES

was opened by Mr. H. DEVINE. He said that his first hope that the new teaching might cure some of his psychotic patients had not been realised. The causal factors in mental illness were more complex and sinister than appeared at first sight, for the original notion of sexual trauma as the essential factor in neurosis had had to give place to that of "congenitally determined libido-fixation," a term sufficiently resembling "psychopathic heredity" to damp the hopes of ardent psychiatrists. So far as the psychoses were concerned the therapeutic possibilities of psycho-analysis were practically negligible; Freud himself had stated that the future would probably attribute far greater importance to psycho-analysis as the science of the unconscious than as a therapeutic procedure. The failure might be ascribed to various factors—e.g., the inability of the patient to coöperate, his imperfect sense of illness, the institutional relationship between patient and doctor, the lack of a suitable technique, or the definite physiological disorder related to the psychoses. Dr. Devine had at one time hoped that paranoia might be amenable to analytic therapy but had been disappointed. Karl Abraham, Pierce Clarke, and others had reported favourably on the analysis of manic-depressives between the attacks, but Dr. Devine had always found the depressive patient singularly impenetrable. The psychosis was the expression of an obscure disturbance of physiological rhythm, and when the attack was over the sooner the patient forgot all about his illness the better. Analysis in the interval might only give him more psychological material to express when he became ill again.

To say that at present we had no specific remedies capable of curing psychoses was not to say that treatment had no value. On the contrary, nowhere in medicine were therapeutic efforts more necessary and at times better rewarded, and among them psychotherapy undoubtedly held a very high place. A large proportion of the daily activities of doctors and nurses in a mental hospital must be included under the heading of psychological treatment. To refuse to admit that psychotherapy could influence the psychology of a patient because his body was biochemically unwell would imply that the mind was altogether independent of the body. Even the administration of a vaccine or a mere physical examination might have striking psychological results. Though the psychotherapeutic methods used in mental hospitals could not be called causal or specific they were not haphazard and unsystematised. At the outset it was essential to take seriously what the patient said, as a free outlet for his beliefs relieved tension and at the same time gave the psychiatrist essential knowledge of the phenomenal world of his patient. Clinical, physiological, and psychological studies all served to reveal different aspects of the same reality, although the morbid impressions of the psychotic could not be suggested or analysed away. As the psychiatrist could not dissipate what was abnormal his main task must be to develop what was normal, to stimulate social consciousness, and to help the patient to pass from purely individual impressions to broader social relationships which he could share with his fellow men. Mental therapy aimed at exercising the function of consciousness, in the hope that the narrow, morbid, psychic content might melt away or at least be relegated to the background as wider social relations became established. It relied upon simple, natural stimuli such as music, games, occupational therapy, and general conversations, treating the patient as if he were sane and helping him to regain the art of living, to attach his emotions and sentiments to external objects, and to exercise his intellect. This therapy, though unimpressive, was often successful. It was essentially active, and the psychiatrist could not remain in the background as a shadowy figure like the analyst; he had to be friend as well as doctor. It was difficult to disentangle mental from physical treatment, for the manner in which a patient was nursed was almost as important as the actual attentions themselves. In the psychoses, as in other illnesses, recovery was something that happened, independent in a great degree of therapeutic efforts. The old French saying "Je le pansay, Dieu le guerist" expressed a very real truth. Psychotherapy, however, was a method which did something to stimulate the biopsychic organism to regain its normal state of equilibrium in relation to its social environment. He did not question the valuable services rendered to psychiatry by the various schools of psychopathology, particularly the work of Jung on dementia præcox. The mechanisms described by Freud were constantly exhibited in psychotic patients, but it was his impression that psycho-analytic practice had not kept pace with the increasing elaboration of its theory. At the moment when something happened within a patient, so that he became uncertain of the reality of his delirious experiences, it was essential to utilise all the therapeutic arts, for injudicious handling at this crisis might drive him back into his dreams once more.

Psycho-analysis in the Psychoses.

Dr. E. A. GLOVER said that the analysis of maladapted personalities led to a qualitative familiarity with mechanisms which, given a quantitative factor, were commonly regarded as psychotic—e.g., the mechanism of projection—which in the normal individual performed the same protective function as in paranoid states. Psycho-analysis had been primarily constructed for the hysteria and obsessional neuroses, in which a relative stability of ego function existed, the ego giving asylum to the neurosis and trying to encapsulate it and continuing to exercise its important function of reality proving. The foundations of psychosis were laid when, to a profound instinctual disturbance was added a disturbance in the structure of the ego. Many of the sensational features of the manic-depressive group in the depressive phrase were due to a usurpation of ego function by the super-ego, while the exalted phases were characterised by an abandonment of function by the super-ego. Depressive states represented a malignant hypertrophy and exalted phases an acute descending paralysis of this unconscious conscience. The forces which stimulated the hypertrophy of the super-ego were essentially the destructive and particularly the sadistic impulses. At the moment when externally directed activity was slowly blanketed by inhibition, the internal regulative system was gradually heating up under the strain of additional sadistic charges until it finally flamed into the state of melancholia. Transference involved a temporary splitting of the ego into its components and the projection of the super-ego on to the analyst. The urgent aim in the treatment of melancholia was the speedy provision of the safety-valve of an externalised and undamageable unconscious conscience. If the super-ego were insufficiently projected, the depression could not be prevented, but the acuteness of the crisis could be lessened by modifying the super-ego by lending it some degree of tolerance, and by rescuing the ego by lending it some degree of resistance. This was done by gathering up the most urgent sadistic material, interpreting it, and indicating the possibility of a more tolerant super-ego and a more resistant ego—in other words, by lessening internal guilt. The manœuvre involved complete absence of impatience, a close scrutiny of every critical manifestation, and a feeling artificial pneumothorax was seldom recommended for the elderly patient, age need not necessarily be a bar if other conditions were favourable. Thoracoplasty was contra-indicated, and tuberculin rarely necessary, though in afebrile cases of slowly progressive type its cautious use might be permitted.

In conclusion, Dr. Young briefly referred to extra-pulmonary types of senile tuberculosis, lupus and surgical tuberculosis of the genito-urinary system being the least uncommon.

Discussion.

Dr. E. J. MACINTYRE spoke of the difficulty of controlling such cases and referred to the percentage of unnotified cases of patients over 50 years of age in the Borough of Bermondsey for the years 1925–29. In industrial areas especially it was important to have close coöperation between the general practitioners and the tuberculosis officers, and between tuberculosis officers and the officers of poor-law institutions.—Dr. V. S. HODSON said that the really important question in regard to prevention was the method of infection. Was it exogenous or endogenous? If endogenous, the tubercle bacilli had remained latent for many years, but there was no inherent improbability in this. If the bacilli could remain latent for 10 or 20 years, why not 50? If senile tuberculosis was a first infection, why was it localised as a rule and so seldom generalised?—Dr. S. VERE PEARSON said that even very old patients could be made quite comfortable in a sanatorium. He had done artificial pneumothorax in one or two patients over 60 who had got on well. He had also given sanocrysin to one such patient with considerable benefit. He was glad that stress was laid on the danger of old patients infecting others, and he gave some instances of this from his own knowledge.—Dr. W. C. FOWLER asked whether high blood pressure was associated with active disease in senile tuberculosis.—Dr. H. O. BLANFORD said that it was obviously possible so to modify sanatorium conditions as to render it suitable even for old persons. One great benefit of this treatment which was sometimes apt to be lost sight of was the comfort and help given by trained tuberculosis nurses.—Dr. J. WATT said he had been struck by the number of cases in which the patient had given no history of contact with tuberculosis but in which on close questioning it was found that the mother or father had suffered from chronic bronchitis. He confirmed what Dr. Blanford had said as to the value of sanatorium treatment for old persons; bronchitis seemed often to be secondary to the tuberculosis instead of the other way about, and in many cases the bronchitis cleared up as the winter advanced.—Dr. J. R. DOBSON gave details of three senile cases he had had in 12 days, including a man 73 years of age.—Dr. DINGLEY said that the admission of old patients to sanatoriums depended partly upon the season of the year, but even more upon the type of sanatorium.—Dr. G. T. HEBERT confirmed Dr. Young's remarks as to the necessity of examining the older members of a family in which the younger members in succession developed the disease. Physical signs might be no guide whatever, especially in bronchitic cases. He often advised against sanatorium treatment during the winter for old people.—Dr. F. R. WALTERS, speaking from his experience both as tuberculosis officer and as sanatorium superintendent, said his impression was that senile tuberculosis was not as often notified as it should be, and he stressed the importance of examining sputum in all cases of chronic bronchitis, not only in the old. Senile tuberculosis was no exception to the rule that, apart from acute or subacute cases, a search into the history would often show a previous breakdown in health which was probably though not obviously tuberculous.

The CHAIRMAN spoke of the difficulty of classification; tuberculosis in the young might be senile in type, and tuberculosis in the aged might be acute in type. Senile tuberculosis in the larynx might be very difficult to diagnose. At Midhurst he had only had three cases sent as tuberculous which turned out to be malignant, but on the other hand he had had literally dozens of cases sent to him as cases of malignant disease of the larynx which proved to be tubercle. In the majority of senile patients with tuberculosis of the larynx the sputum remained negative for years. He joined issue with Dr. Young about treatment, because if these patients could not be sent to sanatoriums, what was to be done with them? Patients who neglected themselves, in whatever social class they might be, died. He gave notes of several illustrative cases, including two in whom the disease was arrested but recurred, and both patients died. Old patients were much less likely to get over a relapse.

Reply.

Dr. YOUNG said he believed in practically all cases the infection was endogenous. Reactivation was often due to reinfection, or rather, superinfection. He did not wish to be thought in any way to criticise sanatoriums; it was simply that as they were usually run they were not suitable for the very old.

DIAGNOSIS AT A TUBERCULOSIS DISPENSARY.

Speaking on the problems of differential diagnosis, Dr. P. ELLMAN (tuberculosis officer, East Ham) said that at a tuberculosis dispensary there was a great temptation to consider cases sent up with symptoms of progressive loss of weight, fever, hæmoptysis, and so on, as potential cases of pulmonary tuberculosis. These symptoms, however, were not uncommon in other pulmonary and extra-pulmonary lesions. The speaker then referred to cases he had himself met with whose histories led him to suspect the possibility of pulmonary tuberculosis. Of these, the most commonly met with were cases of *naso-pharyngeal sepsis* with a secondary bronchitis, or even what was often termed "catarrhal apices," producing cough with blood-stained expectoration, general malaise, and loss of weight. Almost any nasal, pharyngeal, and sinus affection would produce a secondary bronchitis, localised or generalised, with symptoms resembling those of pulmonary tuberculosis. The next most frequently met with type of cases was *mitral stenosis*, and here a routine location of the apex-beat was of great value. In these cases the symptoms simulating pulmonary tuberculosis were, of course, due to pulmonary congestion secondary to the mitral disease. A third group consisted of cases of *specific aortitis* with or without aneurysmal dilatation and aortic regurgitation. X ray screening would clear up the diagnosis in these cases. *Neoplasms* of the lung in his own experience came fourth in in order of frequency, although doubtless in the experience of others this group would take an earlier place. Any patient of middle age with a series of chest symptoms which might suggest pulmonary tuberculosis but which were out of all proportion to the physical signs should be suspected of suffering from a neoplasm. He had had several cases of *bronchiectasis* with histories and in some cases physical signs almost identical with those of pulmonary tuberculosis. Here the value of an injection of lipiodol was well recognised; indeed, in certain cases where physical signs were limited to the apex or upper lobe it was almost impossible to distinguish between fibrosis, tuberculosis, carcinoma, and bronchiectasis without a lipiodol injection. *Hyperthyroidism* was another condition in which the symptoms closely resembled those of pulmonary tuberculosis, and the speaker described three cases of exophthalmic goitre suspected of phthisis whom he had recently seen at the dispensary. Dr. Ellman then referred briefly to the *pneumomycoses* and *pneumonokonioses*, and described an interesting case which proved to be one of broncho-moniliasis. Finally, the speaker suggested that a dispensary to work efficiently should be a department of a hospital where all facilities were available, or at any rate it should be in close contact and have a working arrangement with a hospital.

The **Chairman** spoke of the value of X rays in clearing up difficult diagnoses.—Sir P. H.-S. **Hartley** believed that pulmonary tuberculosis began at the apex and worked downwards. Hilum tuberculosis, except in very young children, was very rare. In tubercle he thought there was always some small alteration in percussion note, and he urged the necessity of a careful examination of the apices in regard to this point. Mitral stenosis and tubercle were once believed to be antagonistic, but although the combination did occur it was certainly very rare. He himself had never seen a case of exophthalmic goitre with pulmonary tuberculosis. He thought it was incumbent on the tuberculosis officer not only to state that a given case was not one of tuberculosis, but also to give a definite opinion as to the condition responsible for the symptoms.—Dr. F. A. **Lucas Hammond** said that as sanatorium superintendents they were often compelled to follow up mistakes that had already been made. It was sometimes difficult to alter diagnoses sent up to them by people who ought to know; and in other cases it might mean depriving a man of his pension. One condition not mentioned by Dr. Ellman was hepatic abscess; he himself had had two such cases sent to him, which cleared up under emetine. Many cases of fibrosis were really cases of silicosis, not recognised as such. He thought they ought to go through every case with a completely unbiased mind.—Dr. C. H. C. **Toussaint** concurred with the last speaker in regard to the number of patients sent to sanatoriums as tuberculous who were not tuberculous, and he showed a number of slides illustrating some of these cases.—Dr. P. A. **Galpin** (tuberculosis officer, West Ham) said that he had had a number of cases of neurosis sent to him as tuberculous. These cases were sometimes of considerable difficulty, showing symptoms such as loss of weight and of appetite, cough, expectoration, and sometimes signs at one apex. The neurosis developed as a result of the stress and strain of domestic life. Banti's disease, or splenic anæmia, sometimes masqueraded as abdominal tuberculosis. He had also had one or two cases in which underweight was the striking feature, but which he believed were really cases of infantilism. Cœliac disease might lead to difficulty in diagnosis; and this he thought sometimes led to infantilism. Cases of chronic pneumonia should, he thought, be kept under observation.—Dr. **Young** drew attention to the possibility of dysentery leading to a mistaken diagnosis of pulmonary tuberculosis, illustrating this by two cases in his own experience.

PATHOLOGICAL SOCIETY OF MANCHESTER.

At a meeting of this Society on March 12th a paper entitled

Recent Work on Streptococci

was read by Dr. A. W. **Downie**. Before the work of the Dicks, he said, the view was held by some observers that scarlet fever was a local streptococcal infection of the throat, and that the general symptoms were due to a diffusible toxin produced by these organisms. This view was not, however, generally accepted until more direct evidence was obtained by experiments on man. A notable advance in the state of our knowledge was made by the Dicks, who produced scarlet fever in human volunteers by swabbing their throats with pure cultures of hæmolytic streptococci. They further demonstrated the production of toxins by means of skin tests in susceptible individuals. Further work on the production of antitoxic sera in horses, and the effect of such sera in the treatment of scarlet fever, and the results of active immunisation by injections of toxin, afforded additional evidence of the view that scarlet fever is primarily a streptococcal infection. Whilst scarlet fever antitoxin had proved valuable when used during the acute stage of the disease, the reports of various observers seemed to indicate that it is much less efficacious in the treatment of septic complications. Moreover, the reports published by Kinloch, Smith, Taylor, and others, and the experimental work of Parish and Okell, suggested that antitoxin immunity does not prevent local streptococcal infection. It had been found that toxins apparently similar to those obtained from cultures of scarlatinal streptococci are produced by hæmolytic streptococci from other human infections such as erysipelas, puerperal fever, and cellulitis. Whilst some of the published work seemed to show that the toxins of erysipelas and puerperal fever differ immunologically from those of scarlet fever, the evidence appeared to be in favour of the view that they are identical and can be neutralised by scarlet fever antitoxin. The difference between the toxigenic properties of scarlatinal organisms and those from other sources seemed to be quantitative rather than qualitative. Recent studies on puerperal sepsis in relation to antitoxic immunity as indicated by the Dick test, however, did not suggest an exact correlation between such immunity and immunity to streptococcal infection during the puerperium. Further, the cases recorded recently by H. Burt-White[1] did suggest that the treatment of puerperal septicæmia by scarlatinal antitoxin yields highly satisfactory results. In streptococcal infections, other than scarlet fever, it could hardly be expected that the results of treatment with antitoxic sera would be as good as in that disease, because all virulent streptococci of the hæmolytic group had not been shown to produce toxin, and toxin of the skin-reaching type was not the only means by which streptococci exert their pathogenic effects. In immunity to hæmolytic streptococci two factors apparently had to be considered: (1) antitoxic immunity, and (2) antibacterial immunity.

Dr. Downie described experimental work bearing on the nature of immunity to hæmolytic streptococci. A discussion followed.

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[1] The Lancet, Jan. 4th, p. 16.

Brighton Hospitals.—At the meeting of the governors of the Royal Sussex County Hospital, the Duchess of Norfolk, the retiring president, spoke of a recent anonymous gift of £3000 towards the hospital's radium fund, and remarked that if people wanted to give a donation for anything special they could not do better than give it to this fund. No fewer than 335 motor accident cases were attended to during the year, 92 being admitted as in-patients, at a total cost to the funds of about £1500; and Brigadier-General Brownlow remarked that of that sum only about a quarter was recovered, and that the real trouble was that people from anywhere in the country who were brought in occupied beds for which local people had been waiting for weeks, and sometimes months. Viscount Brentford was appointed the new president.—The Royal Alexandra Hospital for Sick Children claimed, in its report, to be equal to any other children's hospital in the country; and notwithstanding the many additions and alterations in recent years there was still a waiting list of 60 or more patients. Owing to the operation of the Rating and Valuation Act the rates were £308 instead of about £30, and the general account had been overdrawn to the extent of £1000.—Brighton, Hove, and Preston Dispensary, the Hove branch being the Hove Hospital, showed a deficit on the year's working of £510; and it was claimed at the annual meeting of the governors that Hove Hospital was the first in Sussex to possess radium of its own and to hire it out to medical men and hospitals in the county.—In regard to the Sussex Throat and Ear Hospital, an extension scheme has been in the making for many years; but with £3000 in hand, the belief was expressed that operations would begin before the next annual meeting.—The Sussex Maternity and Women's Hospital celebrates its centenary this year. Last year's work marked a deficit of £1353. Private wards brought in £1000, an increase of over £200 compared with 1928. The Duchess of Richmond and Gordon accepted the presidency.—Erected 98 years ago, the Sussex Eye Hospital is to be rebuilt. More than half of the £25,000 needed has been raised, and it is hoped to begin building operations towards the end of this present year.

delegation of rule-making power. He thinks the proposed legislation will unduly limit the poisons in Part I. of the list and unduly enlarge the poisons in Part II. He objects to the ease with which unqualified persons will obtain a local authority's licence to sell Part II. poisons; licences, he predicts, will be refused only to criminals or lunatics. Unlimited opportunities will thus exist for the purchase of arsenic and nicotine preparations, to say nothing of lysol and hydrochloric acid, both of which, he says, are responsible for a large number of fatalities. It will be possible, he assumes, to purchase more freely than ever enough arsenical weed-killer to exterminate a village, but it will still be impossible to obtain the smallest dose of heroin for a cough without a prescription. Mr. GAMBLE'S lively criticisms indicate the kind of attack to which the draft Bill will be exposed. The medical profession will have its own points to press. The Committee received a strong protest against the harassing and unnecessary provision in Section 3 of the Dangerous Drugs and Poisons (Amendment) Act of 1923, which requires "an order in writing signed by the purchaser" from a doctor purchasing poison. This, says the Report, will be a point for the rule-making authority to consider. It is to be hoped that the Home Office will consider it more favourably than in 1923.

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UROBILINURIA.

DURING the 60 years since the first detection of urobilin by Jaffé, an extensive literature has arisen both upon its chemical composition and origin and upon its clinical significance. The test for this substance and its precursor urobilinogen in the urine has been used more on the continent than in this country. A recent contribution to the literature of the subject is a small monograph by OLAF BANG,[1] of Oslo, who gives an admirable summary of present-day views upon this subject, with notes on some useful original work.

It is generally agreed by observers that the formation of urobilin depends upon both intestinal and upon liver functions, since it is essentially formed in the intestine from the bilirubin secreted in the bile; after reabsorption from the intestine the urobilin is mostly disposed of by the liver, a small portion only escaping in the fæces in the form of stercobilin. Incidentally, there is no certain evidence that urobilin can be formed under any circumstances by the general tissues of the body, and it is thus some index both of the amount of blood destruction which is occurring, and of the functional efficiency of the liver as a whole. An excretion of urobilin in excess of the normal is generally regarded as a general expression of liver damage, but there is no agreement as yet on the limits of the normal. Different tests suggest different answers to this problem. BANG uses a modification of Schlesinger's original reaction, whereby fluorescence is produced in urine containing urobilin when zinc salts are added to it; the modification is that of Marcussen and Hansen, and consists in dissolving 1 gramme of powdered zinc acetate in 10 c.cm. of 96 per cent. alcohol; 10 c.cm. of weakly acidified urine are added, and one to two drops of 5 per cent. tincture of iodine; the mixture is shaken and filtered, and the maximum fluorescence occurs after 20–30 minutes standing if urobilin is present. With varying dilutions of urine and careful standardisation of the illumination BANG has found that this reaction gives a fairly accurately quantitative estimation, provided a few simple precautions are observed. Working with this test he has confirmed the findings of other recent observers that a slight urobilinuria is a constant normal finding. There is, however, a simpler *clinical* test. A red colour is produced when Ehrlich's aldehyde reagent is added to a urobilinogen-containing urine, and when this method is used most observers agree that more than the faintest traces are probably always abnormal. The Schlesinger reaction is the more delicate, and according to BANG, the results in a large number of cases indicate that the boundary between normal and pathological urobilinuria is probably a variable one, and that there is constantly a normal slight excess excretion in the periods following the taking of food. The normal excretion is high in the new-born, possibly of maternal origin, falls later to a minimum, and then shows a small but perfectly definite increase with increasing age.

In healthy men a pathological urobilinuria, which BANG regards as evidence of at least a temporary liver insufficiency, can be produced in various ways. One way is the artificial production of an alkalosis by high bicarbonate medication (controlled by BANG by estimations of the blood alkaline reserve), and the taking of a carbohydrate-poor or carbohydrate-free diet; such pathological "dietetic" urobilinuria may be observed for example in patients undergoing treatment of peptic ulcer, in states of hunger, and in some depressive mental states. In diabetes mellitus the cause can be traced to lack of carbohydrates and to associated liver defect. The beneficial effect of sugar upon a damaged liver is, of course, well known, and in calling attention to the effect of carbohydrate shortage upon liver efficiency, BANG has emphasised a point of some importance. In the diabetics under his observation, a pathological urobilinuria was present in almost all those in whom the sugar metabolism was at all seriously upset, and was a constant feature in 23 patients who were all taking a diet very restricted in carbohydrates; in four untreated diabetics on full diet no pathological urobilinuria was found until a strict diabetic diet was ordered. These results have convinced BANG that undue restriction of sugar in diabetes may do further damage to a liver whose function may already be defective, and that a diet should be given containing sufficient carbohydrate to abolish any abnormal urobilinuria. It seems that the *utilisation* of some 60 g. of sugar per diem is the approximate figure below which pathological urobilinuria is likely to occur; a higher amount than this may possibly act as a protection to the liver against the toxins to which diabetic patients appear to be particularly vulnerable. BANG is thus in accord with those who are against the reduction of the carbohydrate diet to a minimum in diabetes, because of the paramount importance of maintaining the functional efficiency of the liver.

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SHOULD MEDICINE BE A MENDICANT?

THE day when the voluntary hospitals offered little beyond food and shelter to the sick poor is long past; since they grew to be institutions where sick persons are treated—and even on occasion healed—much of the virtue has gone out of their position as objects of charity. Such at least is the opinion of Prof. E. W. HEY GROVES, who, in delivering on March 13th the Harveian lecture at the Harveian Society of London, spoke with considerable distaste of the proficiency in the art of begging to which the voluntary hospitals had attained of late years. Never had donations to hospitals been so lavish, and yet all the large voluntary hospitals were in debt, depending on "maudlin advertisement and the undignified clowning of students in the streets" to keep them open. He described the methods used as mendicancy, but by the end of his enumeration they had assumed the proportions of highway robbery. That students do not consider a hospital collection to derogate from their dignity, and that the public is placidly amenable to this financial bludgeoning he thinks beside the point. Certainly there is no escaping from the fact that the present system leads to duplication of expensive apparatus in all the large hospitals, and that the demands of scientific medicine for elaborate equipment increase yearly. This is responsible for the enormous expenditure; the requirements of a well-organised hospital have reached a complexity which it is beyond the powers of philanthropy to satisfy, and the testimony of failure lies in the long lists of those awaiting treatment. Even a patient with malignant disease may wait months for a bed, while a man with a comparatively trivial disability will be kept from his work for an indefinite period, costing the public unnecessary sums for his maintenance. Already hospitals have to be provided by the State for classes of ailment which cannot be accommodated by the voluntary hospitals, such as fevers, mental and venereal diseases.

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[1] Klinische Urobilinstudien in Sonderheit an normalen und "lebergesunden" Personen. Die Wirkung kohlehydratknapper Kost auf die Urobilinausscheidung. Die Urobilinurie der Diabetiker. Acta med. Scand., 1929 (Supp. xxix.).

In the past, said Mr. HEY GROVES the poor-law hospitals had not pretended to compete with the voluntary hospitals, either in equipment or staff. Under the new Local Government Act the London County Council would no doubt bring the equipment of certain hospitals up to date, but that would not in itself be sufficient to bring them into line with the voluntary hospitals unless their staffs were correspondingly augmented. The treatment of a consultant on the staff of a general hospital at the present time amounted, he said, to exploitation; the hospital consultant was attending the working men and women of one of the richest countries in the world, many of whom were drawn from the middle classes and who paid for their maintenance in hospital. The expenses of a large number of patients were paid by insurance companies, and the only person who remained unpaid was the doctor. The chief argument urged against nationalisation of hospitals was that the doctors would require to be paid; the national insurance scheme produced a large surplus every year which might well be employed to defray the cost of hospital attendances, but this would mean that the doctors would receive fees. Is this a waste of money? The man who wished to become a consultant, said the lecturer, unless he had private means, must struggle during his best years to acquire a competence, so that by the time he was successfully established he had lost the taste for research. There is, of course, another aspect of voluntary medical service, and it would be idle to pretend it is quite as quixotic as it sounds, but it is certainly true that the average consultant spends a large part of his working time at a hospital, and there is no real reason why he should go unpaid for it.

Mr. HEY GROVES did not content himself with criticism of the position as it stands; he had a constructive policy to suggest.[1] By arranging for payment by all patients, except the destitute, according to their means, the cost of apparatus and maintenance could be covered, and fees could be paid to the physicians and surgeons attending the cases. The cost of new buildings and extension of accommodation should be met by a State subsidy, without State control. A central governing body should be formed to coördinate the work of the voluntary and municipal hospitals in order to prevent duplication of apparatus, and to organise the greatest mass efficiency with the least possible expenditure. The cottage hospitals, particularly, should be affiliated to some larger hospital, so that operations and treatment beyond their capacities would never have to be undertaken by general practitioners in outlying districts. All this could be accomplished by an extension of the insurance system, and a demand for reform should come first from the medical profession. But nothing, he concluded, could be done until the sentimental idea of the voluntary system had been abandoned—an idea so false that the very name was ironical.

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AN APPEAL TO THE WHOLE PROFESSION.

THE work of the Royal Medical Benevolent Fund is, or should be, the urgent concern of the whole medical profession. A certain number of practitioners in their old age, through broken health or ill-fortune, find themselves in desperate circumstances with no one to whom they can appeal for help. It is for their assistance that the Fund exists, and the descriptions published by the committee of some of the cases relieved give the measure of its value. In the annual report for 1929, which was mentioned on page 603 of our last issue, reference is made to the strong feeling of the committee that appeals should not be made to the general public. The altruism with which the medical profession is usually credited should be sufficient to make distress among its own members an impossibility. The Fund also extends help to widows of medical men, and daughters who in later years find themselves without means of support; on the death of a practitioner assistance in the education of his young children is sometimes granted, and efforts are made to secure work for them later. Unfortunately, though the income of the grant department for 1929 shows an increase of more than £600 over that of the previous year, the funds available are still too low to make complete relief possible, even in cases where it is most urgently needed. Annuities are given only to the most needy, when there is no possibility of their affairs mending; grants are voted for a period of one year, and paid quarterly. All cases are investigated carefully, to assure the committee of genuine distress, before a grant is made, and subscribers and non-subscribers are assisted equally. The highest annuity which can be given at present is £40 per annum, which is often quite inadequate. A subscription of one guinea a year from every practitioner would make it possible to give sufficient help to all cases. Another suggestion, which should meet with a ready response, is that in case of personal illness the practitioner should send a cheque to the Fund in recognition of the services he has received from a colleague. Subscriptions are urgently needed, and those who are already subscribers can do a service by persuading others to contribute; personal appeals are likely to meet with a better response than printed ones. Subscriptions may be sent to the Honorary Treasurer of the Fund at 11, Chandos-street, London, W. 1.

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[1] See also THE LANCET, 1928, i., 251.

But, as we have pointed out,[1] even when the Wassermann test is carried out by identical methods, the results obtained in different laboratories may differ very considerably—in as many as 25 per cent. of the cases. E. Joltrain and O. Naegeli lay especial stress on the importance of making a thorough and careful examination of the patient and not relying solely on the pathological findings. With this we are in full agreement, although it must be admitted that sometimes clinical methods of investigation will fail to discover any objective sign of syphilis—in "latent inherited" syphilis, as well as in the acquired disease. If, besides a positive blood Wassermann reaction, a positive spinal fluid reaction is obtained, the diagnosis of syphilis is almost certain, and it is almost certainly also an active syphilis of the central nervous system which demands prolonged treatment. A. Marie calls a positive spinal fluid a "danger signal," which may be discovered quite early by systematic examination of the cerebro-spinal fluid, and which, if properly treated, may enable us to avert the very serious nervous system complications of the disease, to which the positive cerebro-spinal fluid shows the patient to be predisposed. This is of the utmost practical importance. Most of the replies expressed the view that a positive serological reaction—even in the absence of all clinical signs—calls for specific treatment, but that the actual method and details of treatment vary with the age of the patient. In the young, and especially in the pregnant woman (as H. Montlaur points out) a positive reaction should mean a prolonged and intensive course of treatment, aimed at making the reaction negative; whereas in elderly people—who, as S. Bergel says, have passed the age of syphilitic aortitis, general paralysis or tabes—treatment should be moderate and cautious. In considering the value of the serological tests in hereditary syphilis, Morhardt in his summary suggests that the Wassermann reaction of the blood is not of great value, but that more importance attaches to parental antecedents and to clinical signs in the patient. This brings into relief the great difference between the prevalent French view of the incidence of hereditary syphilis and that current in this and most other countries. In France a child born of syphilitic parents, if it suffers from epilepsy, debility, an unexplained anæmia, dystrophies, or almost any conceivable symptom, is commonly regarded as being the victim of hereditary syphilis, even though the serological reactions are persistently negative. The sequel is often a course of intensive treatment, and E. Joltrain utters a warning against such indiscriminate medication, since he has seen it do harm in children when applied without any valid reason. In this country nearly every syphilologist treats apparently healthy children in syphilitic families, who have no other sign or symptom of the disease than a positive Wassermann reaction, in an endeavour to make the blood reaction negative and to prevent trouble in the future. It must be admitted that the attempt to make the Wassermann negative in cases of hereditary syphilis is not always successful, but granting this, it is desirable to treat the patient by giving alternate full courses of arsenic, bismuth or mercury and iodides, without troubling too much about the blood test.

Lastly, there are the two conditions known as Wassermann-relapse and Wassermann-fastness. The former refers to a syphilitic in whom the reaction of the serum is rendered negative but subsequently becomes positive again. It is usually the result of inefficient treatment. Such patients if young and strong, require intensive and continuous treatment for two or three years with arsenic, bismuth, mercury and iodides; if they are elderly but apparently well, and the syphilis is of long standing, they should be treated with care, and preferably with intramuscular or subcutaneous injections of soluble salts of bismuth or mercury (L. Hudelo). Wassermann-fastness, on the other hand, implies that at no time during the course of the disease has the serum reaction been negative. Fortunately this condition is uncommon, and in spite of various explanations of its causation—such as the administration of the remedial agents (arsenic and bismuth or mercury) concurrently instead of alternately, or the giving too many or too strong injections whereby the reacting tissues are exhausted—its pathology is still undecided. No one is able to foretell at the outset of the treatment which patient will show the condition, and this reminds us once more that medicine is not and probably never will be an exact science, because it deals with bodies whose chemical and physical make-up differs. Treatment which is usually difficult, though occasionally a spontaneous reduction to a negative has been reported, is well summarised by Hudelo. In the case of old syphilitics, 50 to 60 years of age without clinical signs, and apparently in perfect health, it is unnecessary to persist in treatment; for these are essentially cases of benign syphilis, and there is no need to upset the equilibrium of the patients by exposing them to the real risks of an indefinite course so as to avoid the dangers, often exaggerated, of a Wassermann-fast condition (Ravaut). With younger patients the case is different and serum Wassermann-fastness is often a sign of involvement of the central nervous system (in hereditary as in acquired syphilis) leading eventually to tabes or general paralysis. These patients should be carefully watched and periodically examined—the blood being tested every three months and the spinal fluid once a year. Oral or rectal administration of drugs may be helpful in such cases if intensive injections have to be stopped (Schulmann and G. Levy); and the advice of Milian and others that attention must be paid to general hygiene and tonic conditions, including a stay at the seaside or in the country should not be overlooked. There is still much difference of opinion about the value of non-specific protein therapy, malaria-therapy, injections of sodium thiosulphate in Wassermann-fastness, though in general paralysis the efficacy of malarial treatment is now well established.

MEASLES IN MANCHESTER.

THE Registrar-General's return has recorded an average of 12 deaths a week from measles in Manchester during the past month. The epidemic reached its height in the week ending Feb. 8th, although the attack-rate in the city is not accurately known, since only the first case of measles occurring in a household is compulsorily notifiable by the doctor in attendance, and the others are reported as they come to the notice of the school medical officer and in other ways. During the past five years the measles mortality-rates per 1000 living in the city have been 0·17, 0·20, 0·21, 0·16, 0·08, the figures being only slightly higher than those for the country generally over the same period. The disease is now more prevalent and the mortality is higher in the central and more crowded districts of the city. A large proportion of the deaths occur in children under five years of age, as is indicated by the following figures. In 1925 there were 129 deaths, 123 of which were of children under five years of age; in 1926 there were 156 deaths, 151 of which were under five; in 1927 there were 164 deaths, 156 of which were under five; in 1928 there were 123 deaths, of which 121 were under five; and in 1929 there were 60 deaths, of which 58 were under five. Every known case of measles is visited by a health visitor, who advises the public health authority as to the arrangements for nursing. In any case where poverty prevents the provision of proper nourishment for the patient, free or cheap milk is provided by the corporation. Wards are set apart at the infectious hospital for the reception of cases of measles in which the home conditions are unsuitable. The number of beds so allocated varies; at the present time the number is 40. During epidemic times as many beds as can be spared are set apart for this purpose, as it is believed in Manchester that this provision is of the utmost value in the nursing and treatment of bad cases. The subject of measles is dealt with in popular lectures which are given from time to time by medical officers of the public health staff. During times of epidemic, also, the aid of the district nursing association is called in, and cases are referred to it for nursing, a grant for this service being made by the corporation.

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[1] THE LANCET, 1929, i., 453.

THE STOCKHOLM PÆDIATRIC CONGRESS.

THE second International Pædiatric Congress will be held at Stockholm on August 18th–21st, as has already been announced in our columns. The Crown Prince and Crown Princess of Sweden are the patrons of the Congress, and a Swedish organisation committee has chosen the following subjects for discussion:—

(*a*) The biological effect of direct and indirect ultra-violet irradiation;

(*b*) The physiological and pathological significance of the thymolymphatic system;

(*c*) The psychology and pathopsychology of childhood; their significance as a branch of pædiatric research and teaching, and their application in medico-social work.

The names of the introducers of these subjects will be announced in the near future, as well as the names of those announced in advance by their respective national committees as intending to take part in the discussion. Free debate will follow the introductory addresses by the announced speakers. We have also received an intimation that notification of "free lectures" should be in the hands of the organising committee by April 1st. It is evidently expected that, apart from reports and discussions which have already been arranged for, members of the Congress may desire to initiate debates on particular subjects, when, if the committee approve, from 15 to 20 minutes will be allotted to such "free lectures."

All communications are to be addressed to Dr. I. Jundell, Second International Pædiatric Congress, Stockholm, Sweden, and application for tickets of adherence should preferably be accompanied by the fee, sent as a cheque or money order, and all names and addresses should be printed in block capitals. The fee is 20 Swedish crowns for adherents, and half that sum for accompanying members of their families—a Swedish crown is 1*s.* 1½*d.* For these special pleasure trips have been planned.

AMSTERDAM CONGRESS OF CYTOLOGY.

THE second International Congress of Cytology is to be held in Amsterdam on four consecutive days early in August, either at Amsterdam or Groningen, the precise details to be decided later. The first subject will be the cell and its properties, when A. Gurwitsch (Moscow) will deal with the problem of mitogenetic radiation, and A. Krontowski (Kiev) will speak on carbohydrate metabolism in tissue cultures and its changes under various conditions. The third subject will be the properties of the living cell, either when stained vitally or on micro-section. Possibly there may be time to take up radio-sensitiveness at the same session, and a film by R. Canti (London) will be shown. On one of the other days A. Timofejewsky (Tomsk) will speak on the properties of the blood and connective tissue in culture, while W. Bloom (Chicago), successor and pupil of Maximow, will take as his chief subject the formation of blood in tissue culture. W. von Möllendorff (Freiburg) will deal with the potency of fibrocytes in culture and tissues. For another session the subject of growth and its relations to differentiation and regeneration has been chosen, and among individual contributors are mentioned H. C. Fell (Cambridge) on bone-tissue in culture, A. Policard (Lyon) on cartilage in tissue culture, and L. Doljanski (Paris) on cultivation of liver-tissue and the maintenance of its properties in culture. The subject will be closed with a contribution by A. Fischer (Berlin) on regeneration in tissue culture. A proposal has been made from various quarters to devote the fourth day of the Congress to a discussion on the significance of tissue culture in relation to the culture of bacteria and viruses. The suggestions are as yet provisional and any who wish to take part are invited to communicate before April 1st with the general secretary of the International Preparatory Committee, Frau Prof. Rh. Erdmann, Berlin-Wilmersdorf, Nassauische-str. 17. It is understood that the Histological Institute of Prof. G. C. Heringa in Amsterdam will provide the scientific centre for experimental work.

PRELIMINARY TRAINING FOR NURSES.

THE latest gift of the Rockefeller Foundation to University College Hospital is a preliminary training school for nurses, which was opened by Prince George on Wednesday afternoon. Such a school has been in existence for many years, but it has been inadequately housed. With increase of the number of beds has come a need for more nurses, and the admirable aim of the authorities is to enlarge the theoretical background of practical instruction, and incidentally encourage a better type of entrant. The variety and increasing scope of a nurse's life make a broad professional outlook more and more desirable, and the Rockefeller Foundation is anxious to support institutions which are likely to turn out competent administrators, teachers, and supervisors who can spread the best traditions and methods. The new school is well equipped for the work it has to do. It is on six floors, with separate dining-room and practice kitchen, a laboratory department, and a demonstration room which is fitted like a ward, so that the students will not feel lost on going into the main hospital. Like the students, nurses in training will have access to the anatomy school. Two sister tutors and a staff nurse will have their quarters in the school, and there is room for 20 students, besides the domestic staff. The period of preliminary training is two months. During the second month the students will visit the hospital daily and engage in ward work, and at the end of their term they will be examined in the theory and practice of nursing. If successful, they will then be accepted as probationers. Provision is to be made for Rockefeller students from abroad, who, having been awarded a year's Fellowship, come to England for further experience.

THE SURGICAL TREATMENT OF DEAFNESS.

MIDDLE-EAR deafness, or "conduction-deafness," consists of three principal groups, those due to suppuration and its results, those due to chronic non-suppurative middle-ear catarrh, and otosclerosis. Much interest attaches to measures for the relief of deafness due to the last-named disease, for it frequently advances to a very severe degree, and may be accompanied by excessive tinnitus, and is uninfluenced by any form of treatment. In the last two decades of the last century there was a considerable degree of activity in this direction, and numerous intratympanic operations were designed for the relief of all forms of middle-ear deafness, but the distinction between the various forms were not so well understood then as now. The essential lesion of otosclerosis is the growth of new spongy bone in the capsule of the labyrinth, with consequent fixation of the stapes and often also with occlusion of the fenestra rotunda. It is not to be expected that excision of the drum-membrane, or the establishment of a communication between the antrum and the meatus, as suggested by Malherbe in 1899, would achieve any permanent good in such cases, and they have not, in fact, been found to be successful. Kessel in 1876, and Lucas in 1885, reported the result of removal of the malleus and incus; in cases of stapes ankylosis the ankylosis was in most instances the result of suppurative disease; in deafness due to otosclerosis the results were unsatisfactory. Extraction of the stapes has been tried operators and successes have been claimed, but there are many drawbacks; when the ankylosis is complete, it is often impossible to remove the foot-plate, the delicate crura being broken off instead, while, after successful removal, the foot-plate is replaced by a membrane of connective tissue which will itself become the seat of invasion by bony masses as before. As long ago as 1897 Passow made an opening in the labyrinthine wall below the oval window, and reported two cases. In one of these the hearing of whispered speech improved from close to the ear to ½ metre, and the tinnitus subsided; in the second case the tinnitus disappeared after operation, but returned. Gunnar Holmgren,[1] in 1923, reported four cases of otosclerosis operated upon with the use of a binocular microscope. After exposing the inner wall of the tympanum by a mastoid operation, or by detaching the posterior half of the drum, a mucoperiosteal flap was turned forward from the promontory, an artificial window made, and the flap replaced. One case was not improved, but in the remaining three cases the hearing improved at first, then deteriorated, but remained better than before, and better than in the unoperated ear which had previously been the better of the two. R. Bárány[2] has operated on several patients by opening the perilymphatic space of the external semicircular canal and implanting a plug of guttapercha into the fistula; one patient was worse six weeks after operation, one became completely deaf several years later, but the remainder were not made worse, so far as he had the opportunity of examining them.

On these not very encouraging data, Maurice Sourdille[3] has recently elaborated a similar operation, which he performs in two stages, working with a magnifying lens or a binocular microscope. At the first operation the mastoid is opened, the membrana tympani is separated from its attachment along the postero-superior half of its circumference, care being taken to preserve its connexion with the delicate membrane forming the bottom of the external auditory meatus; following the resection of the entire outer wall of the attic, the chain of ossicles is examined through the microscope, and the head of the malleus resected with or without removal of the incus. The tympanic membrane is replaced and the bottom of the meatus made into a flap which envelops the incus and is applied to the refreshed inner wall of the attic, thus shutting off the tympanum from the posterior part of the middle-ear cleft. The second operation is performed after an interval of several months: a flap is lifted forwards from the region of the bend of the external semicircular canal, and an opening is made into the perilymphatic space, care being taken not to damage the membranous canal, and the little flap is replaced. Mr. Sourdille has performed the first operation ten times on cases of chronic progressive deafness, and the second operation, of opening the semicircular canal, three times. In cases of deafness of medium intensity, he has found so much improvement after the first operation that he has been able to defer the second stage. This operation is practically an ossiculectomy, and it is not clear in what way it can improve the hearing in a case of otosclerosis. It appears that he does not restrict the operation to the extremely deaf, as do Holmgren and Bárány, but considers it suitable to all cases of otosclerosis where bone-conduction of the 128 v.d. fork is maintained or increased. He states that the technical results have been excellent in all but one case, in which further operation was required, and claims that in an almost deaf ear, provided that the bone conduction is maintained, the hearing can be improved to several metres for loud conversation. He makes one surprising statement, which is at variance with Holmgren's experience; it is that improvement in the hearing and in the tinnitus occur equally in the unoperated ear. This would seem to be the result of auto-suggestion, and shows how difficult it is to estimate the functional results of treatment of the deaf, for it is well known that these patients will show a temporary improvement after all kinds of treatment. Mr. Sourdille does not say how long his patients have been under observation, but it is probable that a minimum period of two years is necessary before it is possible to state that improvement is permanent.

On theoretical grounds it would seem that the surgical procedure which offers the best prospect in the treatment of otosclerosis is the establishment, if possible, of a permanent opening in the bony capsule of the labyrinth, covered with a very thin epithelial graft, to take the place of the occluded oval window; but as the condition of the round window cannot be determined beforehand, all such operations must necessarily be tentative. A patient should not be submitted to an operation of this kind unless he is so deaf as to be unable to follow his occupation, and yet he must not have any considerable impairment of the labyrinth. It follows that surgical treatment is suitable only for a small proportion of cases of middle-ear deafness. It is just possible, however, that a surgical technique may be devised which may improve the hearing of a certain proportion of patients suffering from deafness due to otosclerosis, as well as to fixation of the stapes from other causes.

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[1] Acta Oto-Laryngol., 1923, v., 460.

[2] Ibid., vol. vi., p. 260.

[3] Bull. de l'Acad. de Méd., 1929, cii., 674.

WE have to announce the death of Sir John Fagan, at Portarlington, at the age of 86. He was consulting surgeon to the Belfast Royal Hospital and the Belfast Hospital for Sick Children.

IT has been decided to hold the Third International Congress of Radiology in Paris at the end of July, 1931. The President will be Dr. Antoine Béclère, the Vice-Presidents Dr. J. Belot and Prof. Cl. Regaud (Paris), Prof. J. Cluzet (Lyon), and Prof. Réchou (Bordeaux), and the Secretary-General Dr. Ledoux-Lebard, to whom inquiries should be addressed at 122, Rue La Boëtie, Paris (8^e).

THE impending retirement is announced of Dr. Alfred Eichholz, chief medical inspector to the Board of Education. Dr. Eichholz, who is a Fellow of Emmanuel College, Cambridge, has been an inspector of schools since 1898. His reports on the problems of the feeble-minded were among the first investigations of the kind, and led to his being asked to give evidence before the International Commission on Physical Deterioration in 1903, and the Royal Commission on the Feeble-minded in 1908. His knowledge of the special schools in this country may well be unrivalled.

DONATIONS AND BEQUESTS.—The late Dr. John Buchanan, of London, left £4000 for bursaries at Glasgow University, where he graduated, to be used for the foundation of two bursaries in medicine, to be called the John Buchanan Bursaries; and £4000 to the University of Liverpool to maintain a lectureship in Esperanto and to stimulate by prizes the study of the language among matriculated students at other universities.—Dame Mary Hope Walker Cargill, of Lowther-terrace, Glasgow, left over £17,000 for Scottish charities, including £5000 to the executors for charity, £3000 to Glasgow Royal Maternity Hospital, £2000 to the Royal Samaritan Hospital for Women, Glasgow, and £1000 to the Hospital for Sick Children, Glasgow.—Mr. Harold Arthur Lowther, of The Wellington Club, W., and of Bicester, Oxon., left £1000 to St. Dunstan's Hostel for Blinded Sailors and Soldiers and £500 each to the London Hospital, the Middlesex Hospital, Charing Cross Hospital, and St. George's Hospital.—Mr. John Richard Ward, of Cross-street, Manchester, who left £30,694, gave one-third of the ultimate residue of his estate to the Manchester Royal Infirmary for the endowment of beds in memory of his wife and his late daughter, Ethel Railton Ward.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LXV.—THE SIGNIFICANCE AND VALUE OF EXAMINATIONS OF MILK.

PART I.*

AN examination or analysis of milk may be undertaken with two objects, the first to ascertain the chemical quality and the second to determine the bacterial purity. Although medical practitioners are concerned with the chemical quality of milk, especially in relation to its nutritive value, it is the bacterial purity in which they are vitally interested.

Chemical Quality.

Milk is such an important article of diet for young children and invalids that it is imperative that the richness of its important constituents should be maintained. On the other hand, milk is so easily sophisticated that a constant watch must be kept on the quality of what is sold. Local authorities under the Sale of Food and Drugs Act, 1928, which codified all the requirements of previous Food and Drugs Acts, are compelled to appoint public analysts and to take samples periodically for the analysis of milk along with other articles of food and drugs, and generally to administer the requirements of the Act. A medical officer of health, or a sanitary inspector, or a specially appointed officer may at any time take samples of milk and submit them to the public analyst for analysis. These officers will always act on a complaint from a medical man when deficiency in the quality of the milk is suspected. So active have the local authorities been during the last 20 years that the sophistication of milk has very greatly declined. The possibilities of avoiding detection are so remote and the penalties on conviction are so great that the game is not worth the candle.

The usual methods of sophistication of milk are by abstracting some of the milk-fat, by adding skim or separated milk and so reducing the percentage of fat in the whole, or by adding water, which reduces not only the fat but the proteids, sugar, and other constituents.

The general appearance of the milk is but a very rough guide to the quality, and is of little or no value. So also is the estimation of the cream, which rises by the action of gravity after the lapse of a certain time. Milk may be quite genuine, yet the cream may not be very evident in the cream-tube. Temperature affects the rising of the cream, but the treatment to which the milk may have been subjected at the dairy has a much greater influence. For instance, if milk is heated above 160° F., as happened with the old method of "Flash" pasteurisation, which will be discussed later, the amount of cream which rises, or the "cream-line," as it is termed in the milk trade, is adversely affected. Again, if the milk has been homogenised, the amount of cream rising after even 48 hours may be very little indeed. In the process of homogenisation the milk is forced at great pressure through a steel disc perforated with small holes on to an agate plate. The effect of the splashing of the minute particles of fat on to the agate plate with great force is to break up the fat globules to such a small size that they fail to rise in the milk on standing. Milk so treated might, therefore, be misjudged as to quality, yet it contains all the constituents of genuine milk, the only difference being that the fat globules are so small that they will not rise. In at least one part of the London area homogenised milk has come to be appreciated by housewives because it is impossible for any member of the household to abstract the precious cream from the day's stored supply.

The only true test of chemical quality, it can therefore be assumed, is the estimation by analysis of the main constituents. In an analyst's report the composition of the milk is stated as so much milk-fat, so much non-fatty solids, and so much water. In the non-fatty solids are included the sugar, proteids, and mineral salts. The average composition of genuine cow's milk is as follows:—

Fat			3·76
Non-fatty solids	Sugar	4·75	9·04
	Proteids	3·57	
	Mineral salts	0·72	
Water			87·20

By the Sale of Milk Regulations, 1901, made by the Minister of Agriculture, the composition of genuine milk is presumed to be not less than 8·7 per cent. milk solids and not less than 3 per cent. fat. It is very rare that milk from a herd of cows gives less than 8·7 per cent. milk solids, or less than 3 per cent. fat, so that when the former are reduced in percentage below that amount it is presumed that water has been added, and that when the fat is lower it is presumed that fat has been abstracted. Milk containing less than these percentages of constituents, especially if it comes from single cows or small herds in midsummer, may nevertheless be genuine.

Variations in Chemical Composition.

The chemical composition of milk varies with the breed of the cow, its individuality, the period of lactation, its age, the thoroughness with which milking is carried out, the quality of the feeding, the intervals between the milkings and the season of the year, but the variation is chiefly in the fat content, the variation in the non-fatty solids not being marked on any occasion. It is comomn knowledge that breeds such as the Jersey, Guernsey, Devon, Ayrshire, and others produce milk richer in fat than the Shorthorn, which is the most common dairy cow, and that individual cows give a higher percentage of fat than others. The most important of all these factors, however, is the length of the interval between successive milkings. The longer the interval between the milkings the lower the percentage of fat, and since the interval between the morning and afternoon milking is usually much shorter than that between the afternoon and morning, it follows that the milk produced at the afternoon milking has a much higher percentage of fat. In individual cows the difference may be as much as 50 per cent. By making the intervals as near as possible equal, the quality of the morning and afternoon milk may be kept about the same. This factor is therefore, to a very large extent, within the control of the farmer.

By a now famous legal decision, Hunt *v.* Richardson, if the farmer proves that the milk examined was as it came from the cow, no conviction can be recorded even though the purchaser is prejudiced by receiving milk of poor quality. A considerable amount of discussion arose on this legal decision and on other decisions which followed it. Some on the one side contended that the result would be that the farmer would not aim at improving the fat content of the milk produced by his stock, that adulteration would be more likely to escape being penalised by the simple expedient of bringing proof that the milk was as produced by the cow, and that the purchaser should have some guarantee of quality and should not be prejudiced. On the other hand, the farming interests contended that, even though many adulterations might escape from the deserved penalty, no farmer should ever be penalised for selling poor yet genuine milk, and that the remedy was to pay for milk according to its fat content, milk of a higher fat content being met with a higher price. In any case, the law stands as decided by Hunt *v.* Richardson.

Analysis will detect the presence of colouring matter and preservatives, such as boric acid, in milk but, as the addition of these is specifically forbidden by law, and as their value has come to be regarded as slight from the dairyman's point of view, it is rarely that suspicion of their presence arises.

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* Part II. will appear next week.

Bacterial Purity.

The question of bacterial purity may be considered from two points of view, the first in regard to milk produced with special precautions, as in graded milk, and the second in regard to milk infected by bacteria which are likely to produce disease in the human subject. Ordinary market milk may contain any number of bacteria up to millions per cubic centimetre, the number of bacteria present having a distinct relationship to the care with which it has been produced at the cowshed, the manner in which it has been handled in its transit to the consumer, the temperature at which it has been maintained, and the time it has been kept. The total bacterial content is estimated by adding definite quantities of diluted milk to liquefied nutrient agar, which is then poured into flat Petri dishes and incubated at 37° C. for 48 hours. At the end of this time the colonies of bacterial growth, each originating from a single bacterium, are counted and the number of bacteria per cubic centimetre used for dilution is calculated. Coliform bacilli are presumed to be present if, on the addition of milk or dilutions of it, 1 c.cm., 1/10 c.cm., 1/100 c.cm., and so on, to bile-salt lactose broth, acid and gas are produced after incubation at 37° C. for 72 hours, the results being stated as coliform bacilli present in so much milk but absent in the next highest dilution in which a negative result is obtained. For example, the following is the bacteriologist's report on a sample of milk taken in September last year:—

Bacteriologist's Report.

No. of sample .. .. 3 .. Sept. 17th, 1929.
Temperature on arrival .. 22° C.
No. of bacteria per 1 c.cm. .. 113,000
  1/100 c.cm., 1107
  1/1,000 ,, 111
  1/10,000 ,, 12
Presence of *Bacillus coli*, 72 hours.
  1/100 c.cm. .. .. 1. Positive.
  1/1,000 ,, ... 2. Positive.
  1/10,000 ,, ... 3. Negative.

Graded Milk.

The Milk (Special Designations) Order has made it possible for the consumer to purchase milk of certain definite grades, produced under definite conditions, and with some guarantee as to bacterial content. These grades are not readily understood by the public, and their names do not convey any idea of their quality, so that the medical practitioner is often referred to for information regarding them and his advice is often sought as to their value, particularly in regard to their use by young children. An endeavour may, therefore, be made to point out as shortly and as clearly as possible the characteristics of the various grades, which are shown in Table I.

First of all comes *Certified milk*—the highest grade—which must be obtained from a tuberculin-tested herd of cows, which must be produced with the exercise of strict cleanliness and be cooled and bottled at the farm where it is produced. The cap of the bottle must have printed on it the name of the producer, the day of production, and the name of the grade. It should not contain more than 30,000 bacteria per c.cm., and the absence of coliform bacilli should be proved in 1/100 c.cm. With a healthy stock of cows, with all the cleanly precautions at the farm, and with the sealing of the bottle before it sets out on its journey, there is a guarantee of high quality and freedom from infection. Unfortunately, its cost is double that of ordinary market milk, and therefore can only be purchased by limited numbers of the community.

The next in quality is *Grade A (tuberculin tested) milk* which also must be obtained from a tuberculin-tested herd and produced with particular care and cooled at the farm. It need not be bottled at the farm, and is usually transported in labelled churns to the retailer's premises, where it is bottled. This grade of milk is allowed up to 200,000 bacteria per c.cm., and coliform bacilli must be absent in 1/100 c.cm. A high degree of security from disease-producing organisms is obtained in this grade of milk, many samples of which often show as small a number of organisms as Certified milk. It can usually be purchased at 50 per cent. above the price of ordinary market milk.

Grade A milk, which is often thought by members of the public to be the highest grade of milk, comes next in the scale of grades. It is produced with particular care at the cowshed, but the cows only undergo a physical test at regular intervals. The milk must be cooled at the farm, but need not be bottled there. It is allowed the same bacterial content as the previous grade. This grade does not give much guarantee of freedom from the bacillus of tuberculosis, and, in the view of many, does not deserve inclusion amongst the special grades on account of this. It is the standard which should be insisted on for all market milk at the present time, and the Government ought to take its courage in both hands and insist upon it. There is no need for elaborate buildings to produce milk of the quality of Grade A. What is wanted is the exercise of intelligent care and reasonable cleanliness on the part of the farmer and his workers.

Table showing the standards required under the terms of the Milk Special Designations Order, 1923, for the various designations which it is illegal to use in connexion with the sale of milk, except under licence granted by or under the authority of the Minister of Health.

(A) *Raw Milk.*

Designation.	Herds.	Bacterial content.	
		Maximum bacilli per c.cm.	Coliform bacillus.
1. Certified.	Tuberculin tested and physically examined at regular intervals.	30,000	Absent in 1/10th c.cm.
2. Grade A. Tuberculin tested	Ditto.	200,000	Absent in 1/100th c.cm.
3. Grade A.	Physically examined at regular intervals.		

Other conditions.—(1) *Certified Milk*: Bottled on the farm, name of farm, day of production, and word "Certified" on each bottle cap.

(2) *Grade A tuberculin tested, and* (3) *Grade A.*—Delivered to consumers in (*a*) the bottles or the sealed containers as received from the farm; (*b*) suitable containers of not less than two gallons capacity; (*c*) bottles with the name of dealer by whom the milk was bottled, the address of the licensed bottling establishment, the day of production and the words "Grade A Tuberculin Tested" or "Grade A" on each bottle cap.

(B) *Pasteurised Milk.*

Grade A Pasteurised.—Grade A milk that after pasteurisation as required by the Minister of Health, contains not more than 30,000 bacilli per cubic centimetre and no coliform bacillus in 1/10th c.cm. All other conditions as required for Grade A milk.

Pasteurised.—Any milk that after pasteurisation, as required by the Minister of Health, contains not more than 100,000 bacilli per cubic centimetre. No requirement for bottling.

These last two grades must be delivered to the consumers in the bottles or the sealed containers as received from the farm, in suitable containers of not less than two gallons capacity or in bottles with the name and address of the dealer by whom the milk was bottled, and with the day of production and the name of the grade on the cap of each bottle.

THOMAS ORR, M.D., D.Sc.,
Medical Officer of Health and School Medical Officer Ealing.

CROTCH v. MILES.

ACTION FOR ALLEGED NEGLIGENCE IN THE KING'S BENCH DIVISION.

IN the King's Bench Division, before the Lord Chief Justice and a special jury, an action for alleged negligence was brought against Mr. Ernest Miles by Mrs. Martha H. G. Crotch, the allegation being that a pair of forceps had been left in the plaintiff's abdomen, following an operation upon her performed on November 27th, 1920. It was admitted that an operation had been performed, but it was denied that the forceps had been left in the plaintiff's body. While it was pleaded that the action was barred by the Statute of Limitations, the defendant, through counsel, expressed the intention of giving evidence in answer to the charges.

CASE FOR THE PLAINTIFF.

Mr. J. W. Morris, in opening the case for the plaintiff, said that an operation was performed in 1920 upon Mrs. Crotch, who was then living at Richmond, for the removal of a fibroid tumour, and that after the operation her life had been one of continual ill-health and suffering. In 1922 and 1923 Mrs. Crotch travelled to India and back, and on both occasions she was taken ill, while previously, some five months after the operation, a swelling had appeared near the incision which the plaintiff had pointed out to the defendant, who had reassured her as to its cause. In 1925, when engaged in business in Paris, she became ill and was taken into a hospital, and the following year, when carrying on business in the south of France, she was again taken ill. On this occasion an operation was performed on her, after examination at a clinic in Nice, for the removal of gall-stones. Two years later the presence of the forceps in the abdomen was discovered by X rays, a return of pain having taken her to a doctor who advised the procedure. The forceps were removed in September, 1928, since when the patient had been relieved from pain. Mr. Morris submitted that the history of the case was inconsistent with the forceps having been left behind as the result of the operation for gall-stones, and that they must have been where they were discovered since 1920.

Mrs. Crotch said in evidence that after the operation in 1920 she had abdominal pain and a lump in the region of the incision, and returned to Mr. Miles, who accounted for the pain by the fact that the muscles had not recovered from the necessary injury which they had received, but that the symptoms would disappear. This, she said, did not occur, and no organ in her body seemed to function properly; for eight years she had suffered misery. She said that medical men in India and France had been unable to ascertain the cause of her attacks, and, in answer to the Lord Chief Justice, she stated that a metallic taste in her mouth, which she had complained of, was experienced in 1922, long before the forceps were discovered.

The Lord Chief Justice himself examined the forceps, and gave their measurements as about five inches in length and two and a half inches in breadth. The X ray photographs were at the disposal of his Lordship and the jury.

In cross-examination Mrs. Crotch accounted for the pecuniary claim in detail, including under the headings the cost of failure in a perfumery business, and the expenses incurred for the operation for gall-stones, inasmuch as the gall-bladder would not have been affected had not the forceps been left in her abdomen. No doctor, she said, had suggested an X ray examination until the summer of 1928.

DR. RICHARD HENRY EASINGTON STEVENS.

Examined by Mr. MORRIS.

Do you practice at No. 8, Sheffield-terrace?—I have now moved to No. 9, Campden Hill-road.

Are you a Member of the Royal College of Surgeons and a Licentiate of the Royal College of Physicians?—I am.

Did the lady who has just come from the witness-box ever consult you?—Yes, in 1921, 1922, and 1923.

Have you preserved a record of the dates on which you in fact saw her?—I have.

Perhaps you would just give my Lord and the members of the jury the dates?—I saw Mrs. Crotch in 1921 on Sept. 20th, Oct. 4th and 9th, Nov. 20th, 21st, 22nd, 24th, 25th, 26th, 27th, 28th, Dec. 8th and 28th. In 1922 I saw her in February on the 2nd, 3rd, and 28th, the 29th April, May 6th and 18th, and June 23rd, and in 1923 I saw her on August 29th.

I think you also attended upon Mrs. Crotch's brother?—Mrs. Crotch's brother, Mr. Gordon.

The dates which you have given to my Lord and the members of the jury are dates of attendances upon Mrs. Crotch?—Yes, Mrs. Crotch and not her brother or her husband.

You are quite certain about that?—Perfectly.

Perhaps you would tell my Lord and the members of the jury what Mrs. Crotch complained of when she saw you?—She was complaining of a pain low down in the abdomen, a swelling in the middle line of the abdomen, irregularity of the bowels, and attacks of nausea and vomiting.

Did you know that an operation had been performed upon her in the previous year?—Yes.

Did you in fact examine Mrs. Crotch?—I did.

Was there or was there not a swelling on her abdomen?—There was an abdominal hernia, a ventral hernia as it is called.

THE LORD CHIEF JUSTICE. When did you examine her?—1921 I think, my Lord.

Are you not sure?—I am not sure of that, but I am certain that I must have examined her. I cannot remember the exact date.

And what you saw was a ventral hernia?—A bulging.

What is the meaning of the word "ventral" there?—I believe you would call it the belly.

A bulging of the belly?—Yes.

Mr. MORRIS. I think that, other than the records of dates of which you have told my Lord and the members of the jury, you have not any actual notes written at the time about the case?—No, I am sorry, I destroyed them last year.

As regards your fees, have you been paid by Mrs. Crotch for attendance?—Not by Mr. Crotch but by Mrs. Crotch.

How much?—It was ten guineas in all for Mrs. Crotch.

And you have been paid that?—Yes.

If a pair of forceps were lying inside the small intestine might that cause inflammation of the gall-bladder or some infection of the gall-bladder?—An infection of the gall-bladder can be secondary to an infection of the bowel, and usually is.

Cross-examined by Mr. RAYNER GODDARD.

Did you diagnose this hernia at the beginning of your attendance on this lady?—Yes, the first time I examined her, the date of which I forget, there was a bulging which was obviously a ventral hernia.

THE LORD CHIEF JUSTICE. You are asked, did you diagnose a ventral hernia? If you are using the word "hernia" as being just another name for bulging that was a thing which was obvious on view, was it not?—Yes, my Lord, but by "hernia" I mean a bulging of the contents of the abdomen and not of the wall of the abdomen, a bulging of the contents through the wall.

That is to say, that it involves a burst somewhere?—Yes, my Lord.

Mr. Rayner Goddard. Is not a ventral hernia, as it is called, a fairly common sequel to an abdominal operation in a fat subject ?—Very common indeed.

It is formed, is it not, by a stretching of the scar ?—Usually, yes.

Is it a matter in which surgical help is sought ?—In most cases surgical advice is sought, and a belt is prescribed, if no radical operation is advised.

You did not advise the lady to go back to Mr. Miles ?—I cannot remember.

So far as you know she did not go to any surgeon ?—So far as I know she did not.

You were continuing attendance on her on many occasions during November, and two occasions in December of 1921. What were they for ?—For attacks of pain and sickness.

Was that the same during 1922 and 1923 ?—Yes.

I will give you the condition which the French surgeon described of the gall-bladder when he operated. Dr. Prat described the gall-bladder as very diseased, very thickened, and adherent to the surrounding parts. He says he performed the operation at an acute stage when there was fever, swelling, and pain. Would that description be consistent with the gall-bladder trouble being of long standing ?—Yes, but the attacks of pain which I saw in Mrs. Crotch's case were in the lower abdomen and not in the gall-bladder region.

The Lord Chief Justice. Would you mind putting your hand on the sort of places you are referring to ?—*That* is the gall-bladder, and *this* is the lower abdomen where most of the attacks of pain were when I attended her. The gall-bladder is just under the liver.

Where is the liver ?—Chiefly on the right side under the ribs and partly hidden by the ribs.

Mr. Rayner Goddard. Of course gall-bladder pain is very intense, is it not ?—Very intense.

And a patient whose gall-bladder was in that condition must have suffered from pain for a very considerable time ?—Probably, yes.

An affected gall-bladder, you say, may be secondary to an infection of the bowel ?—Yes.

The Lord Chief Justice. He said in fact it usually is.

Mr. Rayner Goddard. Do you mean by that that the cause of gall-bladder trouble is infection of the bowel ?—Most authorities say that it is an infection which travels up the bile-duct from the bowel.

It is still a matter as to which there is a good deal of doubt as to what causes gall-stones ?—Yes.

It is one of the things which medical science has not solved yet ?—No, but it is known it follows typhoid frequently.

That is just what I was going to put to you. If a person has typhoid, which is a serious bowel infection, that may affect the gall-bladder ?—Yes.

But except for infections of that sort that is as far as medical science has gone on the subject ?—I think so.

You do not know of any case in which an infected gall-bladder is supposed to have followed from a foreign body being found in the bowel ?—No, I have known it follow an appendix.

That is where you had definite infection, a sepsis from the appendix ?—Yes.

The Lord Chief Justice. I suppose cases in which a surgeon's forceps are left in the intestines are not counted in their thousands ?—No, I think not.

Mr. Rayner Goddard. And, of course, a surgical forceps which has been used in an operation would have been sterilised ?—Yes.

And had it not been perfectly sterilised a sepsis would have set up in the bowel ?—No, because the sepsis would have been set up in the abdominal cavity outside the bowel.

Do you know that it is said here that the doctor who removed the forceps thinks that it was in the intestine itself ?—I do not see how it could have got there.

Could it not have got there ?—Unless it had perforated its way through.

By perforation it could get in ?—Yes.

As you are here may I ask you about a modern operation. A modern operation is team-work, is it not ?—Yes.

The team consists of the surgeon, the assistant, the anæsthetist, and the theatre sister ?—And a couple of staff nurses and probationers.

I am not talking about general hospitals but a nursing home. There would be some assistants to carry basins and that sort of thing ?—Yes, there would be some nurses.

The Lord Chief Justice. A minimum of five persons and the maximum may be much more ?—Yes, my Lord.

Mr. Rayner Goddard. And, of course, during the course of an abdominal operation a considerable number of instruments are used and a large number of swabs, towels, sponges, and so forth ?—Yes.

Is it recognised in the profession now that the duty of keeping count of the instruments and swabs that are used in an operation is on the sister in charge ?—That is almost universally recognised.

The Lord Chief Justice. The theatre sister ?—Yes, my Lord.

Mr. Rayner Goddard. The surgeon's attention must be concentrated on the patient ?—Yes.

And I suppose in all operations it is desirable to get the patient off the table as quickly as possible ?—Yes.

Is it the anæsthetist's duty to give warning to the surgeon if the patient is showing signs of collapse ?—It is.

Is the moment when you want to ascertain whether the instruments, swabs, and sponges have all been accounted for the moment before the surgeon would begin to stitch up the patient ?—It is.

Would it be in accordance with the recognised surgical practice for the surgeon to cease the operation for the purpose of counting the instruments or sponges ?—No, that is unusual.

Assuming that a fully trained theatre sister is present, would it be in the interests of the patient that the surgeon should suspend the operation to do so ?—No, I should say not.

Does the surgeon then, when it comes to the moment when he is ready to sew up, ask the theatre sister if the count of instruments is right ?—Sometimes. Sometimes she volunteers the statement.

Either he asks or the nursing sister says "Count right" ?—That is the usual practice.

The Lord Chief Justice. She says "Count right," does she ?—She says "Instruments and swabs all correct."

Re-examined by Mr. Morris.

I suppose a surgeon sometimes does an operation with a trained nurse that he knows and sometimes operates with a trained nurse whom he may never have met before ?—Frequently so.

Would it make a difference to the surgeon as to whether he was operating with a trained nurse whom he knew and could rely upon ?—I do not quite understand the question—a difference in what way, a difference to his peace of mind ?

Would he place more reliance upon a trained nurse who knew him and whom he knew ?—Yes, probably.

About how long in time does an operation for total hysterotomy take ?

The Lord Chief Justice. Are you going to leave the question like that, Mr. Morris ? Is it not right to ask at least one other question. (To the Witness): Suppose that the nurse in the particular case is not known beforehand to the surgeon, is it or is it not in accordance with good practice that he should still rely upon her for an accurate count of the instruments and the swabs ?—If he knows her to be a trained theatre sister, my Lord, he would be justified in putting that confidence in her.

Mr. Morris. How long does an operation for total hysterotomy take as a rule ?—As a fair average I should say three-quarters of an hour.

The Lord Chief Justice. What does hysterotomy mean ?—It means excision of the uterus.

Then, to put it simply, to cut out the uterus takes about three-quarters of an hour?—Yes, my Lord.

MR. MORRIS. At the start of an operation like that would the forceps be laid out somewhere?—Yes, on the instrument table.

Would they be laid out in groups?—The Spencer-Wells, that is to say, the artery forceps, would be in a row. The other forceps would be in groups. There would probably be a dozen artery forceps, Spencer-Wells.

THE LORD CHIEF JUSTICE. Then you mean a dozen pairs of scissors?—Yes.

Not the single blade?—Not the single blade, my Lord.

MR. MORRIS. Before actually sewing up the wound would a surgeon feel round the wound, feel inside the body with his fingers?—He might, but the less manipulation the better in most of these cases.

As far as possible would he look inside?—Yes, he would.

THE LORD CHIEF JUSTICE. What is the objection to unnecessary manipulation?—Only that it increases shock to the patient.

MR. MORRIS. For what purpose are forceps of the nature of the forceps in the present case used?—I do not know what the forceps were in the present case.

THE LORD CHIEF JUSTICE. Would you like to look at them?

THE WITNESS. I would like to very much, my Lord. (Forceps handed to the Witness).

MR. MORRIS. What sort of forceps are those?—These are Spencer-Wells. They are used for clipping bleeding points and so stopping the bleeding.

You say they are used for clipping bleeding points. Does that mean that the two ends pinch the particular part where the blood is emerging?—Exactly.

What has the surgeon to do to see that that bleeding does not continue when he takes the forceps off?—He may either twist the forceps and so twist the end of the bleeding vessel or he may slide a ligature over the end of the forceps, tie it, and then remove the forceps, leaving the ligature tied on to the vessel.

So as to stop internal bleeding?—Exactly.

An expression has been put to you by my learned friend "team-work." Of that team, as it was put to you, in that operating theatre who is the captain?—The operating surgeon.

THE LORD CHIEF JUSTICE. Does not the word "team" perhaps rather beg the question? Is it so much a team as a division of labour, not all jointly doing the same thing but each separately doing a bit—I do not know.

MR. MORRIS. May I just get this from you. If the surgeon, after the door of the operating theatre has been closed, gives an order, must that order be obeyed?—Yes, the surgeon is in command then.

He tells somebody to do this, and must it be done?—Yes, except that the anæsthetist under certain circumstances has a say.

THE LORD CHIEF JUSTICE. But is it part of the surgeon's duty not merely to do the actual surgical work as it should be done but also to keep an eye on each of the others to see that each one does his or her part as it should be done?—It is, my Lord, as long as it does not distract too much of his attention from the patient.

The supervision is limited by his primary duty to look after the patient?—It is, my Lord.

MR. MORRIS. You were asked about one or two particular parts of the body. Would you be good enough to indicate where on the body this swelling was that Mrs. Crotch had?—As far as you can see on me just *there* (indicating) in the region of the navel.

THE LORD CHIEF JUSTICE. Just below the navel?—Yes.

MR. MORRIS. Is that what is also called the umbilicus?—Yes.

THE LORD CHIEF JUSTICE. Sub-umbilical means below the navel?—Yes.

MR. MORRIS. Is the operation for hysterotomy one that is sub-umbilical?—It is.

Is the operation for the removal of the gall-bladder supra-umbilical?—It is.

THE LORD CHIEF JUSTICE. That means above it, I suppose?—Above and to the right, as a matter of fact, my Lord.

Mrs. C. Young gave evidence that she had been the plaintiff's maid at the time of the first operation; she said that a month after her return home her mistress had shown her the abdominal wound, when she had seen a swelling.

DEPOSITIONS.

Depositions of witnesses examined in the action Crotch v. Miles, at Nice, in the Republic of France, before Mr. Joseph Wiseman Keogh, His Britannic Majesty's Consul, the Special Examiner appointed by an Order in this action dated 23rd December, 1929.

On the twentieth day of January, 1930, the examination commenced at mid-day. I, the said Joseph Wiseman Keogh, having first administered the oath as prescribed by the rules of the Supreme Court of Judicature, England, to myself, to Miss Renee Bonneau as clerk and shorthand writer, to Dr. Alfred Marie Vadon as interpreter, Mr. John W. Morris (instructed by Messrs. Churchill & Clapham), appeared for the Plaintiff, Mr. Henry C. Dickens (instructed by Messrs. Hempsons) appeared for the Defendant. It was agreed between Counsel for the Plaintiff and for the Defendant that the evidence should be taken direct on to a typewriting machine and that the signing by the witnesses should be dispensed with. I then administered the usual oath of a witness to, and caused to be examined, the following witnesses, who were produced before me on behalf of the Plaintiff to give evidence in this suit.

DR. HENRY FAY residing at No. 20, rue de la Buffa, Nice, having been first duly sworn by me, was examined by MR. MORRIS on behalf of the Plaintiff.

Are you Dr. Henry Fay?—Yes, I am.

Do you reside at 20, rue de la Buffa, Nice?—Yes, I do.

Are you a surgeon?—Yes, I am a surgeon.

Will you please tell us your qualifications?—I studied at the Faculty of Paris, and I qualified as M.D. in 1912.

Have you been practising as a surgeon since 1912?—Yes.

Are you the assistant at Nice Hospital?—Yes, I am.

Did you perform an operation on Mrs. Crotch on the 27th of September, 1928?—Yes, that is the date in my report.

(It was then agreed between Counsel that the original report referred to, dated the 27th of September, 1928, should be put in as the witness's evidence in part.)

Is that the report that you made?—Yes, I made that report myself.

(Report put in and marked Exhibit "A.")

You speak in your report of an X ray photograph. Had you seen an X ray photograph of Mrs. Crotch?—Yes, I saw it the day before the operation.

Had you seen one X ray photograph or two?—I saw two photographs.

Will you look at these two photographs, are those the photographs which you saw?—Surely.

(Photographs put in and marked "B" and "C" respectively.)

What was your fee for the operation?—I think about five thousand francs. But it has not yet all been paid.

Do you know how long Mrs. Crotch was in the clinic after the operation?—I think about one month.

Do you know Dr. Prat?—Yes, I do.

Is he a surgeon of eminence?—Yes, he is.

Was the laparotomic scar at the place where an incision would be made in an operation for total hysterectomy?—Yes.

Were the forceps at a place underneath that old scar?—Not completely, the end of the forceps was a little lower down than the end of the scar.

If forceps were being inserted in an operation would they be inserted by the surgeon himself ?—Sometimes the surgeon, sometimes the assistant.

If a pair of forceps was left inside the body after an operation for hysterectomy, would a swelling be likely to be caused ?—Yes.

Would it be likely to cause great pain ?—Yes.

Will you look at that pair of forceps produced. Are those the forceps which you removed from Mrs. Crotch ?—Yes.

(Original forceps made an Exhibit and marked " D ".)

Cross-examined by MR. DICKENS *on behalf of the Defendant.*

Did you tell Mrs. Crotch that your fee was five thousand francs ?—Yes.

How much of that have you been paid ?—I am not quite sure, but I think she owes me half.

Have you tried to get her to pay you ?—I wrote to her last October, I think.

Have you written more than once ?—I think I wrote three times.

Do you know whether the clinic has been paid ?—I think so.

Any operation inside the intraperitoneal cavity is difficult and dangerous ?—Always.

And it requires great care on the part of the surgeon ?—Yes.

And all his attention ?—Yes.

Such an operation is a hysterectomy ?—Yes.

And a cholecystectomy ?—Yes.

For operations of that kind the surgeon must be assisted by a team, an assistant and an anæsthetist and one or two sisters ?—Yes.

And each member of that team has his or her particular part in the operation ?—Yes.

And if the surgeon knows and trusts the members of the team he will not interfere with their particular part in the operation ?—Yes. He will not interfere.

For instance, he will not interfere with the giving of the anæsthetic ?—Quite so.

Is it not the practice of surgeons in such an operation to leave the counting and checking of the instruments and the swabs to a sister ?—It ought to be like that.

It is impossible for the surgeon himself to keep count of the instruments and swabs which he has put, or his assistant has put, into the body ?—He cannot know.

Then it is possible for a surgeon to leave instruments or swabs in the body without personal negligence ? (Mr. Morris objected to this question.)—Yes, it is possible.

What are the symptoms of cholecystitis ?—Pain in the sub-hepatic region.

What else ?—Fever, nausea ; sometimes pain in the back and in the right shoulder.

Cholecystitis is inflammation of the gall-bladder, is it not ?—Yes, it is.

That itself could not cause trouble in the bladder or in the lower part of the abdomen ?—No.

Or pain on defæcation ?—No.

Before you operated, did you make an external examination of the patient ?—Yes.

And did you, like Dr. Maestracci, discover something hard in the abdomen on palpation ?—Yes.

It was quite obvious, was it not ?—Yes.

And you could not have missed it ?—No.

On Exhibit " E " I have marked with a cross the ileo-cæcal valve and with a circle the duodenum. (Exhibit " E," " Vinton's Anatomical Model," was put in.)

When I said that the forceps occupied a point in the small intestine which one may locate almost half way from the duodenum and the ileo-cæcal valve I meant in the middle part of the length of the intestine (small).

Will you mark on Exhibit " E " exactly where the forceps were located ?—I have done so.

Will you look at Exhibit " C." Was that taken from the front or the back ?—I think from the front.

Does that photograph show the forceps in the position in which you have marked it on Exhibit " E " ?—Approximately the point of the forceps, as shown on Exhibit " C," is in the same position as I have marked it in Exhibit " E."

Are you quite sure of that ?—Yes.

Is not the dark part in the centre of Exhibit " C " part of the intestine ?—Yes. The large intestine.

And the point at the bottom of that dark part is the rectum ?—It is the end of the rectum, the sphincter.

The intestines are shown dark on Exhibit " C " as the result of a bismuth or barium meal ?—Yes.

If you diagnosed a swelling or any abnormality in the intestines you would try to find out what it was by giving a meal of bismuth or barium, and take an X ray photograph ?—Yes.

Any swelling of the intestine which was abnormal would show itself on an X ray photograph taken after such a meal ?—All dilatation is seen under such circumstances as a rule.

Any abnormality ?—Some sorts of abnormality could not be seen.

If you suspected some such abnormality as a swelling you would try this method ?—Yes.

Were the forceps found inside the intestine itself ?—I cannot say exactly whether it was in the tube itself or in a pouch formed by the intestines which were glued together by adhesion, but I concluded that it had been in the tube itself because there was fæcal matter on it.

These forceps have a screw in them ?—Yes.

Screw forceps are used in France, are they not ?—Generally no.

But sometimes yes ?—It may be, I have never seen them.

Do you know the name of F. Gendron ?—Yes.

Is he a well-known maker of surgical instruments ?—No.

During the war were there not English military hospitals on this coast ?—I was not here, I do not know.

Do you know that after the war the English military authorities sold a great quantity of surgical instruments in France ?—I did not know it.

Re-examined by MR. MORRIS.

Does hysterectomy mean the removal of the uterus and of the ovaries ?—Yes.

Is that what is known as total hysterectomy ?—Yes.

I think you have told Mr. Dickens that a surgeon ought to exercise great care in such an operation ?—Great care, yes.

Is it a very serious matter for a surgeon to leave a pair of forceps in the abdomen ?—Yes.

Does a surgeon count the number of his instruments after an operation ?—No, never.

When a surgeon uses forceps in an operation does he clamp the forceps on to some part of the body ?—Yes.

Is the reason as a rule to prevent bleeding ?—Either that or to keep some part of the body out of the way.

Has the surgeon to be skilful as to what part he clamps the forceps to ?—Yes.

And before the surgeon sews up the wound is it his duty to remove the forceps which are inside ?—Always.

DR FREDERICK AYLMER HORT, residing at No. 6, rue du Congres, Nice, having been first duly sworn by me, was examined by MR. MORRIS on behalf of the Plaintiff.

Is your full name Dr. Frederick Aylmer Hort ?—Yes.

Do you reside at 6, rue du Congres, Nice ?—Yes.

Are you a Doctor in Medicine and have you practised as a medical man for the last twenty-seven years ?—Yes.

Perhaps you will give us your qualifications ?—I am L.S.A., M.R.C.S.England, L.R.C.P.London, M.D.Montpellier, France, and a Fellow of The Royal Society of Medicine, London, and M.A. Cambridge.

Did you see Mrs. Crotch in the year 1926 ?—Yes.

Did you recommend Dr. Prat to Mrs. Crotch in that year?—Yes.

Is Dr. Prat a surgeon of experience?—A surgeon of great experience.

Did Dr. Prat operate on Mrs. Crotch?—He did, on the 8th of June, 1926.

Were you present at the operation?—I was.

For what did Dr. Prat operate?—For an infected gall-bladder.

Is your technical term for that cholecystitis?—Yes.

Does the gall-bladder lie just underneath the liver?—It does.

Did Dr. Prat make his incision in a place that would be usual for cholecystitis?—Yes.

Did Dr. Prat remove the gall-bladder in its entirety?—The bulk, if not all, of the gall-bladder was removed.

Was that operation in the sub-hepatic region?—That operation was confined to the region under the liver. The surgeon had to dig under the liver to get at it.

Did Dr. Prat deal in any way with the lower intestine in that operation?—No, not at all; he did not even explore the rest of the abdomen.

Have you been paid your fees by Mrs. Crotch?—I think she has paid everything she owed me.

Can you tell us what your fees were?—I do not remember exactly, but I think between frs. 1000 and frs. 2000.

Does a surgeon have assistants at an operation?—Yes, he has an anæsthetist, a doctor as assistant, and sometimes a sister.

Of those people who is it that would insert a pair of forceps in a patient's body?—Only the surgeon or his qualified assistant.

Who would remove the forceps before the patient's body was sewn up?—Only the surgeon or his qualified assistant.

Is it the duty of the surgeon to see that the forceps are removed? (Mr. Dickens objected to the question.)—The surgeon's, or his qualified assistant's.

Cross-examined by Mr. DICKENS *on behalf of the Defendant.*

You say you attended Mrs. Crotch for some years. Can you give me approximately the date when you first attended her?—I first attended her in the winter of 1925–26.

Did you attend her more or less continuously up to the date of her operation?—Yes.

I take it that you gradually diagnosed gall-bladder trouble?—My diagnosis would probably have been acute abdominal trouble—a more general diagnosis than of gall-bladder trouble.

By the time you called in Dr. Prat had you diagnosed gall-bladder trouble?—To all intents and purposes, yes.

The recognised symptoms of gall-bladder trouble are pain in the region of the gall-bladder?—Yes, acute pain.

Possibly pain in the back?—Yes.

In the right shoulder?—Yes.

Nausea?—Yes.

Anything else?—No.

I take it that as the lady's medical attendant, and as she complained of abdominal pains you had examined her very carefully more than once?—No doubt.

You were not surprised when Dr. Prat diagnosed an infected gall-bladder?—Not in the least.

He operated for cholecystitis and nothing else?—That is rather a difficult question to answer directly, for an operation on an acute abdominal condition is always more or less of an exploratory nature. In fact his operation was confined entirely to the sub-hepatic region.

You, yourself, after careful examination, had diagnosed no trouble except in that region?—None whatever.

Were you the assistant in the operation?—I was not the principal assistant, I think there was another.

Was there a theatre sister there?—Yes.

I take it, after this distance of time, you find it difficult to remember the details?—Certain details are difficult to remember.

I take it Dr. Prat would have had to use swabs?—No doubt.

Forceps to cut off the bleeding points?—Yes.

Those would be pressure forceps?—Yes, but we generally call them artery forceps.

A number would be used?—No doubt.

Do you know what system was adopted to count and check the swabs and instruments which were used?—No.

It is usual, is it not, to leave this counting and checking to the theatre sister if she is properly qualified?—I believe so in England.

Nowhere else?—Certainly not in France.

You do not suggest, do you, that the surgeon, whose whole attention must be concentrated on the actual operation, can keep count of the swabs and instruments which he or his assistant inserts into the body?—I think so in the case of Dr. Prat, because any deep swabbing he would do himself.

As to instruments, do you suggest that he would be able to tell you after the operation had gone on some time how many he or his assistant had used?—That is not my suggestion.

What is your suggestion about that?—My suggestion is that he would at any stage know whether or not any instrument was left in the body.

Do you mean because he could see them?—No, because they form part and parcel of the bit of work he is doing.

But supposing a pair of forceps which was attached to a bleeding point had slipped accidentally into the wound and become hidden either by blood or by the folds of the intestine, he could not necessarily be expected to know that that instrument was in the body, unless he had kept an accurate account of the instruments used?—It is conceivable, certainly, but it is very unlikely in that particular area, and under those particular conditions.

If the patient is in a state of collapse a surgeon would be more likely to fail to discover the presence of such an instrument?—I cannot say.

At this operation in the region of the gall-bladder the whole of the intestine would be below the region of the operation?—At an operation of this sort the intestines are liable to bulge in any direction.

And I suppose they are all covered with blood and mess, aren't they?—No, they are all shut off.

By swabs and towels?—Yes.

They are purposely shut off, firstly to keep them out of the way of the operation, and secondly to protect them from shock or injury or infection?—Yes.

But even so, under such circumstances, in any abdominal operation it is possible for instruments to become temporarily hidden in the intestines?—No, not in any abdominal operation, but in an operation such as this I suppose it is possible.

Dr. Fay is a surgeon of some repute in these parts?—Yes, he is a young surgeon and has not been here very long, but he is very well thought of.

You, yourself, are not a surgeon?—No.

Dr. Fay, who is a French surgeon, has told us to-day that no surgeon ever counts or checks the instruments used at an operation. Would you contradict that?—I am not in a position to say either way.

You continued then to attend Mrs. Crotch after the operation?—Yes.

Off and on?—Yes. Continuously through her convalescence and at intervals since.

Up till when?—Up to the present day.

Did she make a good convalescence?—To the best of my remembrance an excellent one.

Did Dr. Prat suggest to you that there was likely to be any further trouble after the operation?—No.

What sort of treatment did you give her?—Only dietetic treatment.

Did she complain to you from time to time of abdominal pain?—Never.

She saw Dr. Maestracci on the 12th of September, 1928, how long before had you seen her ?—I had not seen her for a considerable time probably.

Did she ever complain to you of urinary trouble ?—Not until after she had seen Dr. Maestracci.

Was it a normal operation of its kind ?—Perfectly normal with no complications.

Re-examined by MR. MORRIS.

You told Mr. Dickens that an operation for an acute abdominal condition is always more or less exploratory ?—Yes.

Will you explain a little more fully why it was exploratory ?—Because no one can be certain of what is going on inside an acute abdomen until he has looked to see.

The diagnosis is really provisional ?—I look upon the diagnosis of an acute abdomen as always provisional.

But in fact there was no exploration other than in the sub-hepatic region ?—None whatever, and for a very good reason, that the patient was not a good subject for operation ; she was fat, not a good colour, and it was to her interest to get her off the operating table as soon as possible.

You told Mr. Dickens that forceps are attached to a bleeding point ?—Yes that is what they are for.

Does the surgeon have to exercise his skill to decide exactly where to attach the forceps ?—Certainly.

When he removes the forceps has he to make some arrangements to see that the bleeding does not recommence ?—That depends on the bleeding. If the vessel is tied it is tied before the forceps are removed.

Is it the surgeon who does that tying ?—The surgeon or his qualified assistant.

Is the matter of bleeding one that the surgeon would have to consider before finally sewing up the wound ?—Yes, certainly.

DR. LOUIS PRAT, residing at No. 24, Avenue des Fleurs, Nice, having been first duly sworn by me, was examined by Mr. MORRIS on behalf of the Plaintiff.

Are you Dr. Louis Prat ?—Yes.

Do you reside at 24, Avenue des Fleurs, Nice ?—Yes.

Are you a surgeon ?—Yes.

For how long have you practised as a surgeon ?—Twenty-eight years.

Will you please tell us your qualifications ?—I am a Doctor in Medicine of the Faculty of Paris, ex-house surgeon of Paris Hospitals, surgeon to the Nice Hospitals, surgeon to the English Hospital of Nice, member of the International Association of Surgeons.

Are you a member of the French Association of Surgeons ?—Yes.

Are you also Chevalier of the Legion of Honour ?—Yes.

About how many operations do you perform in a week ?—About 25 a week.

Did you operate on Mrs. Crotch on the 8th of June, 1926 ?—Yes.

Did that operation take place at the Belvedere Clinic, at Nice ?—Yes.

Where did you operate on Mrs. Crotch ?—I operated in the hepatic region between the liver and the transverse colon adherent to the wall of the abdomen.

What did you do in the course of that operation ?—I removed the gall-bladder, which was very diseased, very thickened, and adherent to the surrounding parts. I performed the operation at a very acute stage when there was fever, swelling, and pain.

Did you explore any part of the abdomen other than the sub-hepatic region ?—I dealt only with the local condition as it would have been a mistake to do anything else as it might have given a peritonitis.

Had Mrs. Crotch had a previous laparotomy ?—Yes. I noticed a laparotomy scar and at the level of the scar I noticed either a sort of rupture with a swelling or a hard mass. I cannot remember exactly.

What did you consider that that was ?—I thought it was an epiploic.

I want you to explain further what you thought it was and what epiploic means ?—When I examined the abdomen of the patient I noticed that she had a laparotomy scar with an eventration, at the level of which I felt a swelling which I diagnosed to be epiploic. Epiploic means abnormal adhesions of the inflamed omentum.

Was the operation a difficult one to perform ?—Yes.

Will you look at Exhibits "B" and "C," two X ray photographs ? Is the part of the abdomen where forceps are shown in them anywhere near the region where you operated ?—No.

What pattern of forceps do you use ?—Kocher forceps made by Collin. They have no screw in them.

Instead of a screw what do they have ?—The two blades are detachable, and the type I use are quite different to the screw type.

Will you look at Exhibit "D." Do you use forceps of that pattern ?—No.

Do you ever use forceps of that type ?—Maybe during the war, and not for operation.

Do you use that type at the Belvedere Clinic ?—No.

Are those forceps of the Collin type ?—No.

Did you use those forceps (Exhibit "D") when you operated on Mrs. Crotch ?—No.

From the appearance of those forceps can you tell whether or not they have been in somebody's body for some time ?—I do not know, I have no experience of this kind of thing.

Did you see Mrs. Crotch after the operation in 1926 ?—I saw her afterwards, about three months ago.

Do you remember what your fees were for the operation ?—Mrs. Crotch sent me the last balance a few days ago ; I am not quite certain as to the amount. I think about four thousand francs.

Cross-examined by MR. DICKENS *on behalf of the Defendant.*

You had very great difficulty in getting your fees paid by Mrs. Crotch ?—Yes. It required a debt-collecting agent to intervene, and then I only got it in instalments.

French surgeons do sometimes use forceps with a screw ?—Probably.

I understand you yourself have seen such forceps ?—Yes, and I have seen one pair here to-day.

During the war there were British Military Hospitals on this coast ?—I do not know, I was in Belgium.

Do you know that at the end of the war the British Military Authorities sold large quantities of surgical instruments in France ?—No.

When you operate who hands you the forceps you want to use ?—I take them off the table myself.

Who is present at the operation ?—My house surgeon, the doctor, and the anæsthetist, and there is also a sister.

Sometimes does your assistant put in forceps ?—Exceptionally.

And the swabs ?—In principle the assistant puts in the swabs.

At your operations, who counts the swabs as they go in ?—Nobody counts them.

Who counts the forceps ?—Nobody counts them.

This operation was a difficult and dangerous operation ?—It was not a simple operation, fairly difficult, and it was dangerous on account of the general condition of the patient, who was also alcoholic.

She was alcoholic ?—I think so. A little. Her doctor told me so. She was not a teetotaller.

When a patient is in the condition in which this patient was, it is important to bring the operation to an end as quickly as possible ?—Yes.

Do you agree with Dr. Hort that during this operation the intestines were bulging in every direction ?—I did not see the small intestine. The transverse colon was swollen, and I had to push it down the whole time to take it out of the way. The colon was always inclined to get into the way of the operation.

It is possible, is it not, in such an operation for a pair of forceps, if it has become accidentally detached, to get among the intestines and to get hidden there?—No, I do not see that that could happen.

Why?—I left a drain in the wound and that would not have healed up if I had left a pair of forceps in the wound.

But if the forceps could have slipped down into the abdomen between the intestine and the wall it would not have affected the drainage of the wound, would it?—If it had slipped right down out of that region it might not, but it would if it had remained in that region.

Will you please mark on Exhibit "B" the line of your incision?—(*The Witness does so with a dotted line.*)

Now about this hard mass. Your recollection of this operation is naturally not a very good one?—My recollection is not very precise. When I examined the patient for a moment I thought of reopening the old laparotomy scar in order to re-make it, because I thought it was not in order; but I contented myself in doing the simple operation on account of the bad state of the patient.

Did you warn Dr. Hort about this?—I do not think so.

Did you tell the patient about it?—I do not think I did.

You were the only person who knew about this; why did you not warn either Dr. Hort or the patient about it?—I do not remember exactly what was at the level of the scar, I remember that the patient had abdominal trouble which had nothing to do with the hepatic trouble. Mainly there was defæcation trouble, a strong pain which we call tenesmus.

This trouble was abnormal and would have to be watched by the patient's doctor?—It had to be found out what was the trouble with this abnormal condition.

How would you find out what the trouble was?—How could I find out?

Could you not find out possibly by X ray with bismuth or barium what the abdominal trouble was?—Yes, sometimes the X ray would show the cause of the adhesions.

Did you not consider it your duty to tell Dr. Hort about this, so that he could have such an X ray photograph taken?—The patient left the clinic before her wound was completely healed, and I never saw her again, until recently.

But you saw Dr. Hort after the operation?—Probably. I have constantly seen him again.

But you never told Dr. Hort about it?—I never spoke to Dr. Hort about this case again.

May I take it that the first time that you mentioned this hard mass to anyone was in December, 1928?—I have never spoken of this case since the operation.

But you did mention it in December, 1928?—I forgot all about the case until I was asked by the Plaintiff's Solicitor to make a report. I then made a report, which I now produce, marked "F."

Re-examined by MR. MORRIS.

In the report which you have just mentioned (Exhibit "F") you say you noticed the existence of a swelling. Is that a reference to the hard mass of which you have been speaking?—Yes.

> It is agreed that the two photographs, "B" and "C," are to be admitted in evidence without calling the photographer.

The Examination was then adjourned until Tuesday the 21st inst.

Dr. DOMINIQUE MAESTRACCI, of No. 12, Avenue Henri Isnard, at Vence, having been first duly sworn by me, was examined by MR. MORRIS on behalf of the Plaintiff.

Are you Dr. Dominique Maestracci?—Yes.

Do you live at No. 12, Avenue Henri Isnard, Vence?—Yes.

Are you a Doctor of Medicine?—Yes.

Will you please tell us your qualifications?—I am an ex-house surgeon of the Paris Hospitals and Laureat of the Faculty of Paris. I am M.D. of Paris.

Did you examine Mrs. Crotch in September, 1928?—I examined Mrs. Crotch on the 12th September, 1928.

Have you made two reports about Mrs. Crotch?—Yes, I made one by myself and one in conjunction with Dr. Fay.

> (It was then agreed between Counsel that the original reports referred to and dated respectively 15th of October, 1928, and 27th of September, 1928, should be put in as part of the witness's evidence.)

Is that your report dated the 15th of October, 1928?—Yes, it is.

(Report put in and marked "G.")

Will you look at Exhibit "A"—is that the report that you signed with Dr. Fay, dated the 27th of September, 1928?—Yes.

Were you present when an operation was performed on Mrs. Crotch on the 27th of September, 1928?—Yes.

Did you administer the anæsthetic at this operation?—Yes.

Are the matters you speak of in your report all correct?—Yes.

Did you see Dr. Fay extract a pair of forceps?—Yes.

Will you look at Exhibit "D." Are those the forceps which Dr. Fay extracted?—Yes.

Are those forceps of a French make?—No.

When those forceps were in the body, how were they placed?—They were placed in the small pelvis.

In your report you speak of a frenulum, which passed through one of the rings of the forceps? Will you explain what sort of a thing that was?—It was what was left of one of the round ligaments which was formerly attached to the uterus. This is also called the broad ligament.

How did it come about that that frenulum was passed right through one of the rings of the forceps?—The round ligament had been cut at the first operation. The forceps were hanging by the ring through which the ligament had penetrated, and had formed adhesions to the intestine. The ring of the forceps was lying at the site of the adhesions resulting from the first operation.

Does that mean that the ligament of which you have spoken had grown?—No. The free end of the round ligament passed through the loop of the forceps and became adherent to the small intestine by the process of cicatrisation.

Would that process take some time?—Yes.

Will you look at the two X ray photographs marked "B" and "C" respectively. Where do those photographs show the point of the forceps to be?—Inside the small pelvis, on the right hand side.

Whereabouts were the forceps with reference to the external laparotomic scar on Mrs. Crotch?—On the right half of the scar, underneath.

Was the external laparotomic scar on Mrs. Crotch at the point where an incision would be made for hysterectomy?—Yes.

Whereabouts were the points of the forceps when they were found?—Inside the small pelvis on the right hand side.

For what purpose would you expect such a pair of forceps to be inserted?—For hæmostatic purposes.

Ought such a pair of forceps to be removed before the patient is sewn up?—Surely.

Do you remember what your charges to Mrs. Crotch were approximately?—Four thousand five hundred francs.

Have you been paid that?—Not at all. I have received nothing.

That is still owing to you?—Yes.

Did Mrs. Crotch's operation take place at the Clinique Ste. Marguerite?—Yes.

Before that operation had Mrs. Crotch undergone any treatment?—Yes, she told me she had had high frequency treatment.

But that treatment did not continue after she saw you?—No.

Do you know Dr. Prat?—Yes.

Have you seen him operate?—Yes.

Have you seen him operate a few times or often?—Often.

What kind of forceps does he use in his operations?—Collin type.

Have you ever seen him use any other type?—No.

Cross-examined by Mr. DICKENS *on behalf of the Defendant.*

You cannot say of your own knowledge that Dr. Prat never used forceps with a screw?—No, but I can only speak from what I have seen. In France surgeons are in the habit of using only detachable forceps, because there are no other kinds in the hospital services.

Will you look at this catalogue. On page 110 there is a pair of forceps with a screw?—It is not a hæmostatic forceps. Those are cheap forceps.

But they could be used in an abdominal operation?—Yes, but not by a conscientious surgeon.

Why?—Because they do not hold tight enough.

That is not because they have a screw?—No, because they are poor make and because they cannot be properly sterilised.

I suppose you have tried to recover your fee from Mrs. Crotch?—Yes.

Several times?—Yes.

Do you know whether the clinic has been paid?—I do not know exactly.

You have said that the process of cicatrisation to which you have referred must take some time?—Yes.

But of course you have no experience of how long it will take?—It certainly took a very long time.

But you have no previous experience of such a case as this?—I have had experience of foreign bodies in the abdomen, but never a forceps.

But adhesions can form in a few months?—Not identical with those of Mrs. Crotch.

When you examined Mrs. Crotch on the 12th of September, 1928, you had no difficulty on palpation in diagnosing something hard in the abdomen, and the presence of an obstacle in the passage of matter?—I had to palpate for half an hour.

You say in your report that on the left one can easily locate the intestinal loops, whilst it is impossible to do this on the right side. That pointed to something abnormal?—Yes.

And as a result of your examination did you advise her to have an X ray photograph taken as soon as possible?—I insisted on it.

It would have been a breach of your duty if you had not insisted on it, would it not?—Yes.

Dr. Fay said this in his evidence.—Dr. Fay made his diagnosis after I had told him of mine. It was I who brought the patient to him and told him my diagnosis, and so it was easy for him.

You had diagnosed something hard in the abdomen?—Yes, I diagnosed a foreign body in the abdomen. I told Mrs. Crotch, before the X ray, that it was either a surgical instrument or an intestinal parasite.

Mr. MORRIS did not re-examine.

Dr. **ALFRED MARIE VADON**, residing at No. 45 Bd. Victor Hugo, Nice, having been first duly sworn by me, was examined by Mr. MORRIS on behalf of the Plaintiff.

Have you translated Exhibit "A," and is Exhibit "H" your translation?—Yes.

Have you translated Exhibit "F," and is Exhibit "I" your translation?—Yes.

Have you translated Exhibit "G," and is Exhibit "J" your translation?—Yes.

Mr. DICKENS did not cross-examine.

The examination concluded at 5.15 P.M. on the 21st of January, 1930.

[TRANSLATIONS].

Translation of reports of Plaintiff's witnesses examined at Nice, exhibited on taking their depositions as part of their evidence.

Translation EXHIBIT "H."

THE doctors signing below:—Doctor MAESTRACCI, former House Surgeon on the hospitals of Paris, and Laureate of the Faculty, residing at Vence, Twelve Avenue Henri Isnard; Doctor Henry Fay, of the Faculty of Paris, Assistant Surgeon of the Hospitals of Nice, residing at Twenty Rue de la Buffa at Nice, certify that they operated on this day, twenty-seventh September, One thousand nine hundred and twenty-eight, at the Clinique Ste. Marguerite, at Nice, Two Rue Mantega, on Madame Martha Crotch, forty-eight years of age, residing at Vence, Place du Peyre.

General anæsthesia by ether was carried out by Dr. MAESTRACCI.

Mr. ESTAVE, House Surgeon of the Nice Hospitals, acted as assistant to Dr. FAY, who operated.

Median sub-umbilical laparotomy going from the pubis to the umbilicus, circumscribing an old laparotomy scar.

In examination of the abdominal cavity one found first numerous very close adhesions of the small intestines between themselves and of some of them with the vesical dome. These adhesions were so intimate that there appears to be a fusion of the intestinal walls between themselves and with the bladder. In order to liberate them, it would be necessary to open the intestinal and vesical cavities and to carry out multiple resections. In view of such destruction the idea of liberating these adhesions was abandoned and one set to work simply to extract the forcipressure forceps which the X ray photograph revealed to be in the lower half of the abdomen, the point directed towards the small pelvis.

As a matter of fact these forceps could be felt through the agglutinated intestinal loops. But it was impossible to extract it freely because it was surrounded on all hands by the intestines and the opaque membranes which connect these intestinal loops. It appeared to be enclosed in a closed cavity. By oscillating it, it was possible to bring its rings into the field of operation. One then found that the forceps is right inside the small intestine and that it is free in its cavity. It occupies a point in the small intestines which one may locate almost halfway between the duodenum and the ileo-cæcal valve.

At the level of the rings of the forceps, the intestinal wall, forming hernia, has become very thin, distended as it is by the width of these rings.

It was exteriorised as far as possible, and, between two Chaput forceps which raised it, this wall was incised for a length of about six centimetres. Through the opening made in this way into the intestines, it was then easy to withdraw the forceps, which, moreover, came away with the greatest possible ease.

It was thus found that it was absolutely free in the intestinal tube.

However, there existed a frenulum absolutely comparable to a round ligament in appearance and dimensions as to thickness, going from one wall of the intestine to the other, and which passed through one of the rings of the forceps which was thus, as it were, suspended in the interior of the intestinal tube. It was necessary to cut this frenulum in order to be able to withdraw the forceps.

The latter was partially surrounded with fæcal matter, on one of the rings this had accumulated and calcified, forming a veritable fecalome.

Closing of the intestinal incision with linen thread in two planes: one total plane and one sero-serous.

Closing of the abdominal wall in one plane with bronze wire, after having put in place a large rubber drainage-tube, the deep aperture of which answered to the point where the intestine had been opened and sutured.

The extracted forceps, half corroded but still solid, is completely rusted, no longer having any trace of nickel plating. Its jaws are joined, but it is not closed. It measures exactly thirteen centimetres in length. The branches of the forceps are not dismountable, but fixed by a screw.

It is impossible to decipher any mark at all on the forceps.

One can only affirm that it is not a forceps either of Kocher or of Pean.

Besides the old laparotomy scar, Madam Crotch had and still has a long parallel scar on the right costal edge. This scar is due to an operation for cholecystectomy which Madam Crotch underwent at Nice two years ago.

EXECUTED at Nice, on Twenty-seventh September, One thousand nine hundred and twenty-eight.

(*Signed*) D. MAESTRACCI. (*Signed*) H. FAY.

Translation EXHIBIT "I."

Dr. L. PRAT, 24, Avenue des Fleurs, Nice.

On the 8th June, 1926, I operated on Madame Crotch for accidents of acute Cholecystitis. My operation only related to the sub-hepatic region. There were quite a number of vesicular-mesocolic adhesions. The exeresis of the retracted thickened vesicle, which was extremely adherent, was troublesome.

I noted by the symptoms presented by the patient on the level of an old laparotomy scar the existence of a swelling which I considered to be an eventration (illegible) with epiploical adhesions. But the serious hepatic condition of the patient imposed upon me a limitation in my intervention to the vesicular zone and I did not explore the abdomen. The patient shows me to-day a hæmostatic pair of forceps which was removed from her subsequently to an operation from the pelvic region. These forceps, which are considerably rusted, are not of the French model which I make use of. They are in particular with a screw, whereas all my French forceps are hinged and are of the so-called Collin type, which can be taken to pieces.

NICE, 17th December, 1928.

Dr. L. PRAT.

Translation EXHIBIT "J." H.E.81917.

Stamped Paper Frs. 3·60.

I, the undersigned, D. MAESTRACCI, Doctor in Medicine, formerly House Surgeon, Laureate of the Faculty of Paris, do hereby declare :—

That on 12th September, 1928, I examined in my consulting room at 12, Avenue Henri Isnard-Vence, Madame Martha Crotch, 48 years of age, residing at Place du Peyre, Vence.

Madame Crotch came to consult me on account of fearful abdominal pains, re-acting on the bladder, occasioning, with urinary incontinence, an intense discomfort of defæcation, and accompanied by frequent flatulant, abundant discharges in sheets, issuing both from the rectum and the mouth, and at the same time with a persistent metallic taste in the mouth.

Characteristic fact: the pains and flatulant discharges are accentuated in the upright position, or when the patient makes a rather sudden movement, bringing the abdominal muscles into play.

Madame Crotch told me that eight years ago in London she underwent a first surgical operation for multiple cysts on the ovaries, which occasioned total hysterectomy and a second operation for cholecystitis; eight days ago, at Nice, she underwent, without result, three high frequency treatments for vesical polypus. She dates back the origin of her trouble to 1920, a short time, she says, after her first operation.

(Second operation done at Nice two years ago.)

Examination of the Patient.

The abdomen of the patient shows two surgical scars, one sub-umbilical, which is old, trace of the first operation; the other of more recent origin, supra-umbilical, transverse, parallel to the lower edge of the liver, trace of the second operation.

This abdomen is voluminous, distended; notably more voluminous and appearing tumefied at the level of its right half.

On percussion.—One limits on the right an abnormal area of dullness, having a rectangular form, and extending from the hypochondrium as far as the liver.

On the left nothing to point out.

On palpation.—On the right it is exceedingly painful, with resistance of the wall.

On the left, this wall is more supple and mobile; one can easily locate the intestinal loops, whilst it is impossible to do this on the right side, and one remarks that pressing back the flatus on the left side of the transverse colon and of the descending colon causes pains in the right side of the abdomen, which are particularly severe at a point situated a little below the McBurney point and followed by flatulant discharge from the mouth and the rectum which give distinct relief.

On deep palpation.—The bladder and the right ureter are also painful (positive points of Bazil).

One has clearly the impression of an obstacle in the passage of matter with a peritoneal reaction, which is more marked round a point corresponding to the point previously mentioned.

All these troubles are accompanied by fever with general discomfort, generalised abdominal pains, and severe thirst caused by a persistent metallic taste.

Purely symptomatic treatment is prescribed, ice on the abdomen, intestinal disinfection, with appropriate diet, and an X ray photograph is asked for, which was taken at Nice by Dr. Daviot and which reveals a hæmostatic forceps in the small bassin (the negatives are, moreover, in the possession of the patient).

The symptoms not improving in spite of the treatment, surgical intervention is advised.

In faith whereof, I deliver the present certificate to serve for whomsoever it may concern.

EXECUTED at Vence, 15th October, 1928.

D. MAESTRACCI.

CASE FOR THE DEFENDANT.

Mr. RAYNER GODDARD, K.C., for the defence, submitted that the action was barred by the Statute of Limitations, when counsel for the plaintiff argued that plaintiff had shown no lack of diligence, having been to expert after expert to ascertain the reason of the prolonged pain, while, when the forceps were discovered she took immediate action.

Legal points having been discussed, Mr. Goddard stated that Mr. Miles was anxious to be given an opportunity for making a statement, whereupon His Lordship said that decision on the points raised could be postponed until after the evidence was completed.

Mr. Goddard, addressing the jury for the defence, called attention to the difficulties arising out of the lapse of time, such as fallibility of memory, destruction of documents, and death of witnesses; for example, he said, a vital witness for Mr. Miles—namely, the theatre sister at the time of the operation, was among those who had died. He pointed out that since the operation in 1920 a further operation upon the plaintiff had been conducted by a French surgeon at the Belvedere Clinic, Nice, who admitted that in his cases nobody counted the instruments or swabs after operation. Following Mr. Miles's operation the plaintiff had gone from surgeon to surgeon, none of whom had discovered the forceps in the abdomen; whereas, after the operation in Nice the source of the trouble had been detected. He asked the jury to consider it an irresistible inference that the forceps had been left in the plaintiff's body at the second operation. Counsel further said that Mr. Miles did not use forceps of the type found in Mrs. Crotch's body, but when operating in the abdomen he used a completely different type known as "Bulldog forceps," and he emphasised a system which Mr. Miles had devised of using instruments in multiples of three as a guide to the theatre sister in counting them.

At the suggestion of the Lord Chief Justice, Mr. Goddard dealt with the responsibility as between theatre sister and operating surgeon of counting the instruments, and quoted a case, where a swab had remained behind, to show that a surgeon was entitled to rely on the sister in this matter. Mr. Goddard quoted the following case, saying: "In the Supreme Court of South Africa it has been held expressly by the Court of Appeal that a surgeon is entitled to rely upon the sister, and that if the Court is satisfied that he did take reasonable precautions and asked the sister if the count was correct, that then the fact that a forceps is found is not evidence of negligence against him. In the South African case a swab had been left, but I do not know that there is any distinction in law between forceps and swabs. The case is, Van Wyk *v.* Lewis reported in 1924 Appeal Division South African Reports, page 438. May I read the head-note to your Lordship?"

The Defendant, a surgeon, performed an urgent and difficult abdominal operation upon the plaintiff. The operation took place in the hospital at night and the defendant was assisted by an anæsthetist and a qualified nurse on the hospital staff to act as his theatre sister. At the conclusion of the operation one of the swabs used by the defendant was overlooked and remained in the Plaintiff's body, from which it passed after a lapse of twelve months. The evidence showed that in accordance with the usual practice at the hospital the defendant had relied upon the sister to count and check the swabs used, that at the conclusion of the operation he made as careful a search as the critical condition of the patient permitted and that both he and the sister believed that all the swabs were accounted for before the wound was sewn up. *In an action for damages for negligence* in failing to remove the swab, held that negligence could not be inferred from the mere fact that the accident happened but that the onus of establishing negligence lay on the Plaintiff. Further, that although the surgeon performing the operation was bound to exercise all reasonable and proper care as it was a reasonable and proper practice to leave the duty of checking the swabs to the theatre sister the defendant was not guilty of negligence.

THE LORD CHIEF JUSTICE. Did the case end there ?—Yes, my Lord.

MR. WILLIAM ERNEST MILES.

Examined by Mr. RAYNER GODDARD.

Are you a Fellow of the Royal College of Surgeons ?—I am.

Are you Surgeon to the Croydon Hospital for Diseases of the Rectum ?—Yes.

And are you Surgeon to the Cancer Hospital, Brompton ?—I am now Emeritus Surgeon to the Cancer Hospital.

That is a special post which I think was created for you ?—Yes, last year.

Are you, among other appointments, Consulting Surgeon to the Royal Hospital at Richmond ?—I am.

And to various other hospitals ?—Yes.

You are a Fellow of the Medical Society and the Royal Society of Medicine ?—Yes.

And are you the author of various works which are regarded now as standard works in the profession ?—Yes, books and papers.

Have you on several occasions conducted operations at Dr. Wadd's Hydro at Richmond ?—On many occasions.

Were you acquainted with the staff at that Hydro in 1920 ?—Yes.

Did you know the theatre sister ?—Yes, I knew her.

Was she a competent person ?—I thought so.

And had she assisted at several operations for you ?—Before the operation in question, before 1920, yes.

I suppose since November, 1920, you have performed many hundreds of operations ?—Yes.

Do you remember the operation on Mrs. Crotch ?—I have a slight remembrance of it. I cannot remember actual details except in some points, but in some cases an impression is made upon your mind of the features of a case which are, of course, lasting.

What particular feature of Mrs. Crotch's case remains in your mind ?—That the fibroid tumour of her uterus was adherent to the surrounding tissues which was evidence of pre-existing peritoneal inflammation.

Do you remember the patient herself ? Was she a good subject for operation ?—She was stout.

Do you remember anything taking place during the operation, any communication from the anæsthetist about the patient ?—Towards the end of the operation, yes. The anæsthetist said that the patient's condition was such that the operation should be completed as soon as possible.

Why was that ?—Well, the pulse was beginning o fail and the breathing was not too good.

There was a danger of collapse, you mean ?—Precisely.

Before you go down to the Home where you are going to perform your operation how do you arrange your instruments ?—At that time I indicated to Miss Ruddock what instruments I required. I always take the same number of instruments for every abdominal operation, the only variation being special instruments to meet special requirements.

How are your instruments collected together ?—The instruments were all put out, and then I myself saw them and packed them into a special box which I had specially made, a box about 10 inches long, 5 inches broad, and 4 inches deep, and this box was perforated with holes so that it could be used, if necessary, as the tray of a steriliser. With that box I always have the same number of instruments, six small pressure forceps, commonly known as Spencer-Wells, six Cocker's forceps, six Bulldog forceps, nine tissue forceps, then three scissors, and three special instruments, all in threes or multiples of three.

Had you any special purpose or design in thus arranging your instruments in threes or multiples of three ?—Yes, many years ago, at the outset of my surgical career, I devised that method for this simple purpose, as it is commonly known that anyone can count three but not more than three at a glance. Also that if in threes, or multiples of three, any other number shows that it is wrong. Twos, fives, and sevens are wrong; *threes, sixes, and nines* are correct.

You mean at the end of the operation ?—At the end of the operation.

Are surgeons aware that there is danger of an instrument getting concealed ?—Certainly. Cases have from time to time occurred.

And is it to guard against that that you devised this scheme ?—Precisely.

When you get to the scene of the operation what do you do with the instruments ?—Take my bag up to the theatre and then hand over the instruments to the theatre sister. I count the instruments out to the theatre sister and show her that they are in threes and multiples of three.

Does she sterilise them ?—The theatre sister sterilises them and lays them out on the special table relegated for the instruments.

Is that done while you are rendering yourself aseptic ?—Yes, generally washing up and putting on the sterile gown, mask, gloves, and so on.

We have got to the point that you count out the instruments in the presence of the sister. We may go now and follow along the stage of the operation. In an abdominal operation of this description, what is the first step that you take on the patient after he or she is anæsthetised ?—I first of all make the incision. In this case it was from the umbilicus to the pubis in the middle line, what is called a median sub-umbilical incision. It goes through the skin and subcutaneous and fatty tissue first of all. There are three or four bleeding points, as a rule, with that incision. I use Spencer-Wells 5-inch pressure forceps to seize those vessels to enable me to tie them. I generally do the tying and my assistant removes the forceps after the vessel has been tied. Occasionally, if it is more get-at-able, I hold the forceps and my assistant ties the vessel. It may so happen that it is easier for one to do it than the other.

When the vessel is tied what is done with the forceps ?—The forceps are put on one side. Then the next incision is made through the sheath of the rectus, usually in these cases the right rectus muscle. That is a long strap muscle extending from the pubis to the ensiform cartilage and the lower part of the ribs. We avoid, if possible, dividing muscle.

Does bleeding occur in that part of the operation ?—Yes, there may be two or three vessels bleeding there which require picking up with small pressure forceps. Then they are tied and the pressure forceps are removed.

What is the next stage ?—The next stage of the operation is to shut off fatty tissues and the sheath of the rectus muscle. I use Cripps's swabs, and I clip these with what is known as Moynihan towel clips.

THE LORD CHIEF JUSTICE. Is Cripps the name of a man ?

THE WITNESS. The instrument is named after a surgeon inventor. Then you fix those to the sheath of the rectus muscle on either side with three Moynihan towel clips.

MR. RAYNER GODDARD. By the time you come to that are such Spencer-Wells forceps as you have been using removed from the patient's body ?—Everything must be removed in order to enable you to shut off the wound in that kind of way. There can be nothing remaining on the wound that you have already made.

THE LORD CHIEF JUSTICE. Do you mean you could not perform this stage of the operation unless they were removed ?—No, you could not place the swabs in position unless the forceps had been removed. The next stage of the operation is incising the peritoneum, which is bloodless and requires no hæmostasis.

Does that mean stopping the bleeding ?—Yes, my Lord. The next step is to place a self-retaining abdominal retractor.

MR. RAYNER GODDARD. That is an instrument to hold the wound apart ?—Yes, just like my two fingers like *that* pulled apart so as to thoroughly expose the field of your prospective operation.

Are you now in a position to deal with the uterus ?—In this particular case there was a large tumour very nearly about the size of my head. Directly you open the wound there is the tumour in front of you. All intestines have been pushed away by the tumour which arises out of the pelvis.

Do you use or have you ever used in this operation a Spencer-Wells forceps in the abdominal cavity ?—I have been performing abdominal operations for thirty years, and I can say quite emphatically and confidently I have never used a pair of small 5-inch Spencer-Wells forceps in an operation of this kind for the removal of the uterus.

How do you deal in this operation, then, with any bleeding points that may arise inside the cavity ?—In order to remove the uterus there are six vessels to tie. There is an ovarian vessel on either side, an artery and a vein running in the free edge of the broad ligament. Then on either side there is a vessel in the round ligament which is a branch of the deep epigastric artery, and there is on either side the uterine artery which supplies the uterus. I have never placed a pair of forceps on any of those vessels. I under-run each of them with an instrument known as a Reverdin needle-holder, a French instrument and a very excellent instrument. It has an aneurysm needle attachment. You can put a cutting needle or an aneurysmal needle into the holder. For this purpose I use the aneurysmal needle. Passing the ligatures round these six vessels they are thus tied off before the vessels are severed. Therefore there is no bleeding.

THE LORD CHIEF JUSTICE. Would you repeat what you said, beginning with the word "passing ?"—Passing the aneurysm needle beneath these six vessels I withdraw the ligature under each vessel and tie it. Each vessel is tied before it is divided, so that there is no bleeding.

MR. RAYNER GODDARD. Is there any other part of the operation in which you use a Spencer-Wells forceps ?—None whatever.

Do you ever have a Spencer-Wells forceps on the body of a patient who is about to undergo this operation after the peritoneum is severed ?—Never.

You told us about the tying off of the six vesssels in the abdomen. Are there adhesions, do you find, in these cases ?—In a great many cases there are none, but in this particular case there were many adhesions.

How did you deal with those ?—One breaks down adhesions by sweeping one's hand round the tumour. The tumour is generally adherent, or it was in this case adherent, to the pelvic wall. Also there were some adhesions to the omentum, that is a structure hanging from the stomach.

You do that with your hand and without an instrument ?—Yes.

After the uterus and the tubes have been dissected and removed are you ready then to begin to close the wound ?—After the tumour itself has been removed ?

Yes ?—You see, in this operation it has been mentioned that it was a total hysterotomy. That is not my recollection ; it was a sub-total hysterotomy, and a total hysterotomy does not necessarily mean removal of the ovaries. In this case I removed the left ovary and tube because they were matted together with the tumour by old pre-existing inflammation.

THE LORD CHIEF JUSTICE. You say this was not total but sub-total hysterotomy ?—Yes.

Then you went on to add something ?—I only removed, in this case, the left ovary and Fallopian tube.

Did you remove the uterus ?—Yes.

All the uterus ?—Yes, the uterus together, with that Fallopian tube, so that when the uterus was removed all that was left was what is known as the supravaginal surface.

MR. RAYNER GODDARD. Are there two anatomical portions of the body called the round ligament and the broad ligament ?—Yes. The round ligament is embryologically and anatomically quite distinct from the broad ligament. One is a fibro-muscular band.

I only want to know, are the round ligament and the broad ligament two perfectly distinct things ?—Two totally distinct things.

Dr. Maestracci in his evidence referred to the round ligament, and said it was also called the broad ligament ?—He is entirely wrong. I know one of the best text-books in French, Tatu's text-book on Anatomy, and he is very distinct on the point.

It was also said by Dr. Maestracci that he found a portion of this ligament jutting through the ring of the forceps. Will you tell me, first of all, what happened to the round ligament and the broad ligament after the uterus had been dissected ?—The round ligament has very definite anatomical relations. It is attached to the upper part of the uterus immediately in front of and below the entrance of the Fallopian tube. It passes out under cover of the peritoneum between the layers of the broad ligament and leaves the abdomen at a given anatomical point. That anatomical point is the internal abdominal ring, and the internal abdominal ring is a point midway between the anterior superior spine of the ilium and the spine of the pubis.

I want to know what you did with this ligament. That is all I want to know ?—The round ligament is divided close to the brim of the pelvis so that the greater part of the abdominal portion of it is removed with the uterus. The stump, which is never more than an inch in length, is always buried when the peritoneum is sutured, and for this reason, that anatomically the round ligament lies beneath the peritoneum.

You bury it ?—Yes.

And is it sewn down ?—Absolutely.

In the peritoneum ?—Beneath the peritoneum.

And what becomes of what is left of the broad ligament ?—The broad ligament practically does not exist after it has been divided. It is only a double fold of the peritoneum and when you sew its margins together that completes the sewing of the peritoneum.

Is it possible for the remnant either of the round ligament or the broad ligament, anatomically speaking, to have been through the rings of these forceps found where the X ray photograph shows they were found ?—No, for two reasons. One is that when the peritoneum is sewn it is a flush surface, and the free end of the round ligament is buried beneath it. Another reason is that if that round ligament had been through the ring of the forceps the ring of the forceps would have to lay at a definite anatomical point which would be shown five inches lower than it is shown in the X ray photograph.

Would the forceps have been laying with their point down or the point up ?—They could not lie with the point down because, with the ring at that level, you would have to perforate the bottom of the pelvis.

After you have dissected the uterus and sewn up those ligaments does a period come when you are ready to sew up the patient?—Yes. There is the stump of the uterus left which is the supravaginal surface. I use Kocher's forceps and my assistant holds them up so that the stump is brought up out of the depths within reach, and I then sew with a round curved needle.

Is a Kocher's forceps anything like a Spencer-Wells?—Not a bit. These are the forceps invented by Professor Kocher, of Berne, Switzerland. They serve the purpose of a pressure forceps, but they have a tooth at the end so that you can catch hold of a thing and it does not let go. That is Kocher's forceps as distinct from a Spencer-Wells forceps. (*Exhibiting.*)

THE LORD CHIEF JUSTICE. Perhaps the jury would like to see them.

MR. RAYNER GODDARD. May I at the same time hand the jury a 5-inch Spencer-Wells? (*Forceps handed to the Jury.*)

What is the length of the Kocher forceps?—About 5½ inches to 6 inches, I should think. It has a ratchet there. It is very different from the Spencer-Wells; it is to increase the pressure.

Who holds the Kocher forceps?—My assistant.

Who was your assistant in this case?—Dr. Wadd.

THE LORD CHIEF JUSTICE. Two pairs apparently?—Yes, two pairs; one anteriorly and one posteriorly.

And he holds them in that way so as to bring up and expose for sewing what?—To bring within reach the stump of the uterus. We call that the supravaginal surface.

MR. RAYNER GODDARD. Could you perform with Spencer-Wells forceps what you have to do with Kocher's forceps?—No; for two reasons, one that they would be too short to reach, and another that they would slip up because they have not got that spike in the end, and the uterine tissue is very tough.

During this operation what has become of, or what do you do with, the intestine?—The small intestine is packed off into the upper abdomen by means of a Cripps' swab; at least, that is what I use. Some surgeons use a sterile towel; others use a gauze swab. I prefer the Cripps' swab.

Is that something in the nature of a handkerchief or towel?—About the size of a handkerchief, of a special texture.

Who hands you the swabs from time to time?—If there is an assistant nurse in the theatre, then she generally hands the swabs, provided that she is a clean nurse.

You mean a sterilised nurse?—Yes. It is a technical term; clean as opposed to dirty.

One who has been sterilised for the operation?—That is right.

If there is a sterilised nurse present she hands you the towels?—Yes.

Otherwise, who does?—The swabs you mean?

Yes?—The theatre sister if there is no sterilised assistant nurse present.

It is either the nurse or the sister?—Or the sister.

When you get to the stage when you can sew up the patient, what happens?—I make a practice of asking the theatre sister to give me four Kocher's forceps.

THE LORD CHIEF JUSTICE. Do you use the terms "nursing sister" and "theatre sister" as meaning the same person?—The sister and the theatre sister are the same, and the other is generally spoken of as the theatre nurse.

You use now the expression "nursing sister." Who is she?—What I meant, my Lord, was the theatre sister. I ask for four Kocher's forceps, which are handed to me, and usually at that time the theatre sister indicates that she is correct in her instruments; and if she does not, and I do not see for myself—at a glance I can generally tell—then I ask the question if all is correct.

THE LORD CHIEF JUSTICE. Will you mind repeating that last statement?—Usually at that time I ask for four Kocher's forceps. Those are handed to me. At that time the theatre sister usually indicates that she is correct—I mean by that that her instruments and swabs are correct. She may do so in a variety of ways: she may say: "You have a pair of scissors" or "a pair of dissecting forceps," or she may say that she is short of a particular instrument, or more than one. That is an indication to me that she is correct, and if I get no such indication I ask if all is correct.

MR. RAYNER GODDARD. If I heard you aright, I did not quite follow one thing. You said she may say: "I am short of one"?—Yes.

Then you said: "That indicates that she is correct"?—Then I have to find it. Sometimes a thing may get hidden in a towel.

THE LORD CHIEF JUSTICE. And when she says these things which you mention, to whom is she saying them?—She is saying them to me.

MR. RAYNER GODDARD. Can you keep count yourself of the various things that you are using?—No, and I do not attempt to; but with my system of three and multiples of three I can just glance at a thing and see. I know what is happening; at any rate, I know whether the theatre sister is counting the instruments during the operation, which she ought to.

On whom do you rely for the counting of the instruments?—On the theatre sister.

Is that in any way peculiar to yourself, or is that the accepted method in modern surgery?—No. That is the accepted method in all hospitals.

Are theatre sisters trained in this respect?—Very carefully.

In your judgment, would it or would it not be in the interests of the patient if the surgeon relied upon himself to count and check the instruments?—It would be absolutely impossible for the surgeon to go about trying to find or count up instruments.

THE LORD CHIEF JUSTICE. Impossible for the surgeon to do what?—To hunt around for a supposed missing instrument or swab. He would be exposing the patient to greater risk by delaying the operation.

MR. RAYNER GODDARD. But if the instrument is reported as missing, what do you do then?—Then it has to be looked for. Then I have to satisfy myself that it is not inside the abdomen.

Could you check the instruments yourself—I do not mean necessarily hunt round for a missing instrument, but at the close of the operation when the patient is ready to be sewn up would it be in the interests of the patient that you yourself should check with your own hand the instruments?—No, it would delay matters.

THE LORD CHIEF JUSTICE. Does it really then come to this, Mr. Miles, that if the theatre sister says that the number is correct you act upon that statement?—I am quite satisfied.

MR. RAYNER GODDARD. After the patient has been put to bed do you pack up your instruments yourself, or do the nurses do it?—The nurse in the theatre generally washes them; then I have them put out after they have been washed and dried; I myself pack them into my receptacle. In doing so I always count them to see that they are correct.

Have you ever found in the course of your surgical career that your instruments were not right?—I have never missed a pair of forceps—never in the whole of my existence—that is, surgical instruments.

When you get home after an operation to whom do you give your instruments?—Miss Ruddock. Up to about 1925 she used to do this; but that includes 1920. Up to that time she unpacked my bag, took out the instruments, laid them on the table so that I could see them before they were put away, and she counted them.

That is the same lady who packed the bag?—Yes.

You have been telling us, as I understand, about your usual practice in operations. Are you able to say, one way or another, whether you carried out that routine that you have told us of when you operated on Mrs. Crotch?—It is very difficult to remember details of what you did ten years ago, in just the same way as I cannot tell you particularly whether I shaved first or had my bath first on any particular day; but

I usually have a bath and I usually shave, and I am perfectly certain that on any day during the last ten years I have done both. I can only say that I probably carried out the routine which I generally adopt, but specifically I cannot remember each individual instance.

Are you able to say, one way or another, definitely whether you were short of forceps after the operation?—I can say that absolutely definitely.

That you were not?—That I was not.

Did you see Mrs. Crotch in the nursing home before she left?—That is, after the operation?

Yes, after the operation?—Yes, I may have seen her two or three times. I do not know.

Is there anything that remains in your memory, as to whether you can say that the convalescence was other than normal?—I can speak of her convalescence as uninterrupted.

Do you remember anything more about it than that?—Nothing whatever.

Do you as a rule desire to see your patients after they have left the nursing homes?—I always request the patient or request the doctor to ask the patient to see me after an operation at the termination of the convalescence. That is usually done when they have gone down to the sea for three or four weeks; after their return I wish to see them, especially after an abdominal operation, and I like to see them for the express purpose of seeing whether their scar is sound.

You know Mrs. Crotch came to you on the 10th May, 1921?—She did.

Was that earlier or later than you expected to see her?—Very much later, because I had arranged with Dr. Wadd that she should come at the termination of a three- or four-weeks' convalescence.

Did she give you some explanation of the delay? You need not go into it?—She had some domestic trouble.

What recollection have you of your interview with her in May, 1921?—When she came to my house, of course I sent her into the derobing room. Next to my consulting room is a small room with a couch where a patient can get undressed. After the preliminaries of conversation I sent her in there. I am quite certain, although I cannot actually remember it, that I examined her. I always put patients through definite tests.

She said you made her cough?—Yes. I do everyone. To see whether the scar is sound. I say "Cough," to see whether there is any herniation.

We know from Dr. Stevens, who saw her in the following September, that at the time he saw her there was a hernia?—I heard him say that.

So far as you have any recollection, was there any hernia when you saw her?—To the best of my recollection there was none; and I say so because if there had been I should have immediately reported it to Dr. Wadd, whose patient Mrs. Crotch was; she was not my patient beyond the fact that I operated on her. She was his patient.

You mean that she is your patient for the operation. After that she is the doctor's and not the surgeon's?—Yes. After that I had finished, and she had no right to come to me without Dr. Wadd, unless he sent her.

I think the Plaintiff said in her evidence that you told her that the lump——

THE LORD CHIEF JUSTICE. What she said was this, Mr. Rayner Goddard: I will read it to you: "I came to see the Defendant in May, 1921. I told him I was seedy and worried, and could not understand why I had the lump; and he said to me: 'Well, let us have a look.'" Have you any recollection of that?—I have no recollection at all of her saying anything about a lump.

Then she said this: "He examined me thoroughly, saw the lump, pressed it, made me cough several times, and then said: 'Now, don't worry; you will not need to have another operation'; and that because I had expressed the fear that I might have to undergo another operation. He said that the cause of the lump was some injury in the course of the operation of the muscle of the abdomen, and that I need not worry." Have you any recollection of that?—No recollection at all. I cannot conceive that I should say that she would have an injury to the muscles of her abdomen, because it would have been absurd.

Then she went on to say: "I said: 'You are certain that I have not got another growth,' and the Defendant said he was certain. 'I cannot see,' he said, 'how you can possibly have another growth, as there is nothing for it to grow to.' He said that I had not had a fair chance since the operation, and that I would get well with rest and care. I think he prescribed some medicine. My mind was relieved. He said that I must not expect to get over an operation of that kind in less than a year." Do you recollect any part of all that?—No. I cannot recollect the details of the conversation, but I am quite certain I never said that there was nothing for a tumour to grow to, because that would have been an utterly ridiculous thing to say. If I said anything of the kind I should have said: "nothing to grow from," not "nothing to grow to."

Can you say aye or no did you see a lump?—I have no recollection whatever of seeing a lump. I am quite positive about that.

MR. RAYNER GODDARD. Did you write to her doctor?—I believe I telephoned to Dr. Wadd; I do not think I actually wrote to him, but I think I telephoned him to say that I had seen Mrs. Crotch.

Supposing there had been a lump there, what would have been the treatment you would have ordered?—First of all, I should have formed an opinion as to the character of the lump. The most likely thing would have been a hernia.

Assume that it was, as Dr. Stevens said he afterwards saw, a hernia; what treatment would you have given?—Then I should have suggested wearing a truss or a belt.

Do you agree with Dr. Stevens that this is a common thing after abdominal operations?—Very often, after an abdominal operation on a fat subject. Surgeons differ from ordinary mechanics. We have to deal with what we are given, what the patient provides us with; we do not choose it like the man who makes a house.

Is there any danger in the hernia?—Not unless it becomes big and becomes strangulated. If there is a hernia you use a truss to protect it, because you might get a strangulated hernia.

THE LORD CHIEF JUSTICE. What is a strangulated hernia?—When a portion of the intestine thrusts itself through a small opening, and the neck of the opening becomes tight and cuts off the blood vessels—strangulates them.

MR. RAYNER GODDARD. Dr. Stevens told us that in September of 1921, when he was consulted by this lady and found that she had got this lump, she was also complaining of some pain in the lower abdomen. Would that surprise you?—I do not see why she should, because there was no connexion between the ventral hernia and pain in the lower abdomen particularly.

Is there anything after an abdominal operation which may cause any pain in the patient from time to time?—Sometimes adhesions. Now this patient had very extensive adhesions to her uterus, which, as I said, was evidence of pre-existing inflammation. She probably may have got adhesions to the part where the adhesions were separated. That is a very common thing to have.

At any rate, there was no further reference of the patient or by the patient to you?—None whatever.

You remember, I think, that a friend of hers came to see you in July, 1924, but have you any recollection of her coming with the friend?—Mrs. Crotch either wrote or telephoned—I cannot tell which—that she wished to bring a friend of hers to consult me, and she did bring the patient. She brought the patient to my present address. I examined the patient and she paid her fee, but I did not examine Mrs. Crotch.

Mrs. Crotch, I think, says that she did not say more than that she was seedy——

THE LORD CHIEF JUSTICE. What she said was this: "Incidentally, the Defendant said to me: 'You do not look very well; you look very poorly,' and I said, 'Oh, I am always seedy.' He examined my friend and told me she had cancer. This alarmed me because of my own state, but he said to me, 'Don't you worry; you are all right.'" Do you recollect anything of that?—No, I do not recollect the details of that.

THE LORD CHIEF JUSTICE. She went on to say: "I did not ask him to look at my lump, nor did he."

MR. RAYNER GODDARD. I want to ask you now about two or three matters which have arisen from what you have heard of the medical history since 1921. She has told us that when she went to India she had dysentery?—Yes, I heard that.

And, I think, malaria. So far as you can speak, could the presence of a foreign body in the intestine have caused dysentery?—Certainly not. Dysentery is due to a definite amœba.

What is that—a germ?—It is an organism.

Could there be any connexion between dysentery and gall-bladder trouble?—Oh, yes. Dysentery leads to an ulceration of the rectum and colon, chiefly the rectum, and you may get as a sequel to that gall-bladder inflammation, cholecystitis—quite a well-recognised possibility.

THE LORD CHIEF JUSTICE. Although the presence of forceps might not directly cause dysentery, might they set up an internal condition which in its turn might develop into dysentery?—I do not think so, because dysentery is a specific disease.

MR. RAYNER GODDARD. You have heard also Dr. Prat's evidence that when he operated on the bladder for gall-stone he noticed at the site of your operation a swelling which he took to be a hernia of some sort?—Yes.

Is that consistent with Dr. Stevens's evidence in your opinion?—I think so—probably one and the same thing.

Would forceps in the intestine where you know they were found be indicated by a lump—I mean the sort of lump which Dr. Prat described? Can you form any opinion upon that?—I can imagine that a pair of forceps among the intestines would produce a tumour.

A tumour?—A tumefaction, at any rate.

THE LORD CHIEF JUSTICE. A swelling?—Yes.

MR. RAYNER GODDARD. Would that be an external swelling like hernia?—Oh, no.

What would be the difference?—It would be inside the abdomen among the intestines: it would not be extruding through the abdominal wall like a hernia.

How would you discover it; by palpation or by observation?—You mean to discover a pair of forceps in an abdomen?

Yes?—By X rays.

THE LORD CHIEF JUSTICE. "Palpation" means handling, does it?—Yes, feeling in *that* way (demonstrating).

MR. RAYNER GODDARD. Would you see anything on the outside or would you have to handle the patient?—No; you would have to palpate very carefully. If they were deeply down in a fat abdomen you would not feel anything at all.

Would you deal with one matter. (X ray photograph and chart handed to the Witness.) Has Dr. Fay marked the position of the forceps in accordance with the position shown in the X ray photograph?—That is on the diagram?

Yes?—Yes, he has marked it there.

Does that correspond with the X ray photograph?—No. Where he has marked it the forceps lie longitudinally and parallel to the middle line, whereas in the X ray they are obliquely placed and to the right. *This* is dead in the middle line parallel with the middle line.

The X ray photograph—the other photograph—of course, shows them underneath the incision made by Dr. Prat?—Yes, on the right side.

There is no question from that photograph that they are in the neighbourhood of the scar that your operation made, is there?—Yes, they are in the abdomen and not in the pelvis. What we call the pelvis is what the French call "le petit bassin," and they are not in "le petit bassin," according to that photograph.

How do they lie in relation to the area with which you dealt?—My incision would be running along *there* in the middle line, and those forceps are well to the right of the middle line. (Demonstrating on the X ray photograph.)

You have just shown us where your incision was. Where is Dr. Prat's mark?—*That* is Dr. Prat's mark across *there*, and mine is straight down the middle line (indicating).

(To be continued.)

The Services.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Sub-Lt. F. W. Chippindale to be Surg. Sub-Lt.

Surg. Sub-Lt. F. W. Chippindale to be Surg.Lt.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. R. Storrs, having attained the age for compulsory retirement, is placed on ret. pay.

Maj. and Bt. Lt.-Col. F. D. G. Howell to be Lt.-Col., vice Lt.-Col. R. Storrs to ret. pay.

ARMY DENTAL CORPS.

Lt. R. G. J. Tovey resigns his commn.

TERRITORIAL ARMY.

Lt. D. S. Middleston to be Capt.

Second Lt. C. A. Lindsay (late M.G.C. (Infy.)) to be Lt.

R. Coyte (late Surg. Lt., R.N.), to be Lt.

ROYAL AIR FORCE.

Air Commodore J. McIntyre is appointed Director of Medical Services, Air Ministry.

Flight Lt. R. Thorpe is granted a permanent commission in this rank.

Flying Officer P. B. L. Potter is promoted to the rank of Flight Lt.

Maj. A. A. McMullan (Army Dental Corps) is granted a temporary commission as a Squadron Leader (Dental) on attachment to the R.A.F.

Flight Lt. S. A. McCormack (Capt., Army Dental Corps) relinquishes his temporary commission on return to Army duty.

DEATHS IN THE SERVICES.

Surgeon-Major Alexander Gamack, an old Hon. East India Company's servant and retired member of the Indian Medical Department of the Indian Army, died at his residence at Hampstead in his 97th year on March 8th. The son of William Gamack, a solicitor, of Peterhead, Aberdeenshire, he received his early education at the Academy in that town and later entered at the University of Aberdeen where he graduated M.D. in 1854. In 1856 he became a licentiate of the Royal College of Surgeons of Edinburgh and in the same year joined the H.E.I.C. and became assistant surgeon, reaching the rank of Surgeon-Major after some 20 years' service. He was for a considerable time zillah surgeon and jail superintendent at Madura.

The Air Ministry announces the appointment of Group Captain Henry Cooper, D.S.O., an Honorary Surgeon to the King on relinquishment of this appointment by Air Vice-Marshal David Munro, C.B., C.I.E., who has retired.

POST-GRADUATE COURSE AT WITWATERSRAND UNIVERSITY.—On Feb. 3rd 100 South African doctors arrived at the Medical School of Witwatersrand University, Johannesburg, for a post-graduate course. The course opened with an address by Prof. Raymond Dart and consisted of lectures addressed to practitioners and district surgeons. The course for district surgeons included lectures on public health, hygiene, medico-legal, and post-mortem work. The Union Government has taken an interest in the course and has paid the fees of district surgeons attending as well as providing them with railway travelling warrants. Many more applications were received for the course than could be accepted.

Special Articles.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

New Departures in Health Administration.

AT a recent meeting of the Edinburgh branch of the Institute of Public Administration, Dr. Parlane Kinloch, chief medical officer for the Department of Health, gave a lecture indicating the new developments in health. The effect of the health services in their environmental and curative aspects was illustrated, he said, by a reference to the gradual lengthening of the average span of life from 20 years in the sixteenth century to under 25 years at the close of the eighteenth century, 47 years in 1910, and 56 years in 1928.

"Consider," said Dr. Kinloch, "exactly what the figures mean. They mean, of course, first, that since the beginning of the nineteenth century the average span has been more than doubled. But they mean much more than that. They mean also that life is more vigorous for our people as a whole. Do not be misled by scaremongering articles about interference with nature's laws of the 'survival of the fittest.' What the short but triumphant story of public health reveals is that if we knew enough and could apply what we knew, all children born might survive to a healthful life and a good old age. As it is, with imperfect knowledge imperfectly applied, we can approach closer and closer to that ideal."

He indicated also how the family practitioner, who was still the backbone of medical service, could be brought into organic contact with the new health machinery. A comprehensive domiciliary medical service for the general population might best be obtained by extending the insurance principle to the dependants of insured persons, and possibly also to classes of people like the small shopkeeper who had not hitherto come within its scope.

I learn that plans are afoot for bringing into closer relationship with the public services the whole work of the approved societies. Hitherto the gap between the public medical services and the societies has been very badly bridged. Plans are being considered for a more effective rapport between the available services and the approved societies as well as the insurance committees. It would be very strange if these complicated organisations remained unaffected by the new system of public medical organisation.

Scotland and Medical Education.

The Medical Register for 1930 and the Medical and Dental Students' Register contain some interesting figures. They bring out in a striking way the great proportional part played by the Scottish medical schools in medical education. The peak both in England and in Scotland was reached in 1919, when 1375 students registered in England and 1387 in Scotland. For the ten years following, England's figures were: 1099, 833, 946, 210, 390, 496, 577, 503, 544, 630. Scotland's were: 910, 602, 587, 243, 435, 410, 494, 539, 577, 626. In the totals for the years from 1905 to 1929, England has 16,473, or 41·8 per cent., against Scotland's 14,951, or 37·9 per cent. Since 1923, the low water mark, Scotland has in each of three years actually exceeded England. In 1929 the two countries are nearly equal—630 against 626.

At the graduation end of the curriculum the Scottish proportion is not so great; but even here the smaller country much more than holds its own. On the average of the 20 years ending 1929, 694 graduates entered the English Register; 471 the Scottish. Here Scotland has nearly 68 per cent. of England's figure. In the last five years the average registrations for England were 973 against Scotland's 504, which, however, is about 52 per cent. Again, in 1930, the total on the Medical Register as at Jan. 1st is 54,870. Of this total, 26,314, or 47·9 per cent., entered by the English Register; 17,198, or 31·3 per cent., by the Scottish. This is a substantial preponderance for England; but then England has a population of some 36,000,000; Scotland has not quite 5,000,000.

Population has, perhaps, no very direct relation to medical graduates; but it is at least interesting to note that, while Scotland's registrations are about 3·4 per 1000 of the Scottish population, England's are only 0·73 of the English population.

An Exhibition of Health and Hygiene.

The second Edinburgh health exhibition, promoted by the City of Edinburgh and organised by the medical officer of health, has been opened by Mr. Watson, solicitor-general for Scotland, acting as deputy for the Secretary of State. The Lord Provost took the chair, and the Waverley market was well crowded for the whole afternoon. At the exhibition two years ago, some 120,000 people passed through in the course of ten days. This year's exhibition is to be open for 16 days and, to judge by the popular interest, the previous numbers will be far exceeded. One of the chief attractions is the child welfare section, where one can see a day nursery at work, with infants being fed and managed; an ultra-violet ray section with children undergoing exposure; a day nursery in full activity, and demonstrations of remedial massage. The Edinburgh mothers made a large crowd in this section. They were also keenly interested in the demonstrations of cookery, where working women were cooking their food with working-class fires and appliances. There is an admirable exhibit of foods and they attract much attention. There is a section for irradiated milk, a section on venereal diseases arranged by the British Social Hygiene Council, and an admirable exhibit by the Dental Board. Agriculture is represented by real cowsheds and real cows. Among other striking objects on view are a waterfall, illustrating a modern electric power plant, and a "slum" kitchen and stair-head, which is a masterpiece of realism. The City Corporation deserve the thanks of the whole community of South-Eastern Scotland for this extraordinarily effective effort in health propaganda.

A point made by the Solicitor General in his address was that there should be a closer contact between the experimenting and thinking mind of the medical schools and University, and the trained minds and exhaustive records of the public health department. If there was that collaboration, the experience garnered by the public health department could be used to direct and guide the line of inquiry and practical thought of the academic mind; the experimenting of the academic mind could be tested in the organisation of the public health department.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

A Medical Society Educates the Public.

AT the recent annual joint meeting of the medical societies of New York, Pennsylvania, and New Jersey a full report was presented of popular educational work carried out during the last four years in the last-named State. The work began when a medical executive secretary was appointed by the State Medical Society, one of his several assigned tasks being the inauguration of such a campaign. He began by educating the legislators regarding the claims of cultists—work which is said to have borne good fruit. At the same time lectures were given to lunch clubs such as Rotary and Kiwanis. In the second year the speaking campaign was extended to radio and since then regular 15 minute talks have been broadcast. Copies of broadcast addresses were syndicated to the press. Response to the radio speeches came from as far East as Scotland and as far West as San Diego. In the third year a new factor was added by the formation of the Women's Auxiliary to each county medical society. These societies help (1) by self-education in study groups; (2) by the promotion of the public education campaign of the medical society; (3) by gifts of dressings and appliances to hospitals and patients; and (4) by securing or donating subscriptions to *Hygeia*, the popular health magazine of the American Medical Association. For the last three years the medical secretary has been assisted by a lay woman who has given all her time to health education. During the year 1928-29 76 addresses were given to an aggregate audience of 6250. Last autumn the campaign entered the schools and in two months (November and December, 1929) no less than 13,288 pupils were addressed.

Untruthful Advertising.

The National Better Business Bureau has made public a stipulation obtained by the Federal Trade Commission from an unnamed corporation selling and distributing cigarettes and other tobacco products. In this document the corporation admits the use of testimonials for advertisement, obtained from "famous people" for a "valuable consideration," to the effect that the products "protect from irritation." The advertisement also contained a testimonial or endorsement supposedly by certain actresses that they remained slender by the use of these particular cigarettes, when as a matter of fact the actresses in question do not smoke cigarettes at all. A statement was broadcast over the radio purporting to come from a well-known musical comedy star and saying that he used these cigarettes when making a certain talking picture. Although he received a consideration for this statement, he had not prepared it or seen it prior to its use. The corporation agrees to state in future when its testimonials have been paid for, this statement to be published conspicuously with the advertisement. In future, also, the corporation will refrain from advertising such statements as "Women retain slender figures" and "Overweight is banished." They also agree that if they should ever resume any of these questionable practices the signed stipulation of facts may be used in evidence against them.

The Control of Venereal Diseases.

Surgeon-General H. S. Cumming recently made a report to Congress on the control of venereal diseases in the United States. This he regards as being still one of our major public health problems. In spite of the decrease in prevalence that has taken place since the world war there are constantly under treatment or observation by physicians approximately 474,000 cases of gonorrhœa and 643,000 cases of syphilis. It is estimated that 697,000 cases of gonorrhœa and 423,000 cases of syphilis seek treatment for new infection in the course of a year. The Public Health Service has sought to control the spread of these infections through coöperation with State and local health authorities by educational work and by research. A recent investigation concerned the incidence of syphilis among negroes in the southern rural districts. A campaign has also been launched for the prevention of venereal disease in the American merchant marine. The Public Health Service is coöperating with the Health Section of The League of Nations.

The Psychoneurotic Aspect of Heart Disease.

At a recent meeting of the New England Heart Association Dr. J. A. P. Millet discussed the problem of psychoneurosis in heart disease. Security is a fundamental need. When it is threatened the patient goes through doubt, fear, and obsessions to anxiety. The heart gives often alarming evidence of its failure to function normally. Therefore the physician must be definite in his prognosis. Any uncertainty that may appear in his mind will be multiplied ten times in the mind of his patient. Too much exercise must not be permitted, but restrictions should not be unnecessarily severe or the patient's anxiety will be increased. The understanding of the physiological basis of his symptoms will often be helpful to the patient. Reports of cured cases will add to his assurance.

Public Health Services.

SCHOOL MEDICAL SERVICE.

—	Number on roll.	Average attendance.	Routine inspection	Special and re-inspection	Percentage of defects.
Taunton	2816	2595	955	2994	14·7
Torquay	3880	3384	1411	5661	23·5

Taunton.

THE school dentist's report which opens the year's review of school medical work at Taunton contains some satisfactory facts and figures. As Mr. A. J. Percy, L.D.S., remarks, it frequently happens that parents are more fearful of dental treatment than the children themselves, and it is encouraging that more and more parents are attending the clinic with their youngsters; the proportion of appointments kept (75 per cent.) is also quite good. The ratio of fillings to extractions of permanent teeth was over 4 to 1. In the general medical report it is seen that coördination is at its maximum, for Dr. John Allen is at once medical officer of health, school medical officer, and medical officer for maternity and child welfare, while the school nurses also act as school attendance officers. Taunton has the advantage of being the site of the orthopædic clinic of the Somerset County Council, and the council's tuberculosis dispensary is open to Taunton cases every Monday. In elementary school equipment improvement is urgently needed, for a supply of drinking water is lacking in several schools, while others still have trough closets. The fact that so many schools had to be closed on exceptionally cold days suggests that the heating arrangements are none too good. In regard to treatment, Dr. Allen gives a list of agencies through which parents may obtain help for their children. An unusually large percentage (3·7) of children were found to need treatment for tonsils and adenoids; most of these obtained it for the most part independently of arrangement with the hospital. The orthopædic clinic with its specialist surgeon, sister and voluntary helpers, continues to do good work. There are no special schools of any kind in the borough, but several children have been sent to residential schools outside. Dr. Allen writes interestingly on the mentally defective and the recommendations of the Departmental Committee. "Certification and notification (when necessary) is now only possible," he says, "for children from 7 to 14, and in some cases up to 16." It would be more exact to say that children under 7 cannot be compelled to attend special schools; they can do so if the parents are willing and if the schools are available, or they may be dealt with under the Act as feeble-minded and neglected. In his list of conditions under which an adolescent defective can be dealt with, he omits alleged "neglect," a section which is not interpreted with unreasonable strictness. But that many difficulties arise from the absence of special school accommodation is only too true.

Torquay.

Dr. T. Dunlop mentions the increasing need of assistance for the one school nurse on account of the extension of the borough, and Dr. J. V. A. Simpson notes that a new school is being built in the region of the new housing scheme which will conform to the high standard maintained in the borough. It is not always realised how far-reaching is the importance as an educative force of the hygiene of school buildings. Much is being done in Torquay for the pre-school children; treatment is open for them at the school clinics, including operations for tonsils and adenoids, and (especially valuable) treatment for early squint cases by glasses and fusion training. The orthopædic scheme also takes in pre-school children, and they are included in the dental provision; it is hoped to get each infant at the welfare centre to the dentist for inspection, and treatment, if necessary. Tribute is paid to the school nurse, Miss Highes, and a chart shows how the percentage of unclean heads has fallen from 30 in 1908 to 2 in 1929. Arrangements have been made for dealing with tonsils and adenoids at the Torbay Hospital; the children are kept in hospital for about a week, and full provision is made for after-care. Dental work is satisfactory; only 106 permanent teeth were extracted on account of decay, compared with 3028 fillings—a ratio of nearly 30 to 1 in the right direction. The percentage of genuine objectors is only eight, and it is felt that this figure could be lowered by special efforts on the part of the teachers; in one school the percentage availing themselves of the facilities offered was 78, in another it was only 52. Nineteen per cent. promised to obtain treatment privately, but the promises were not always honoured. The condition of the teeth in the Grammar School children was not as much above the average as might have been expected. Excellent work is going on at the open-air school, at which also rheumatic heart cases are cared for; this school also deals with some crippled children who would elsewhere go to a special school. With the full orthopædic scheme in operation it may be hoped that one day crippled children will be rarities, crutches and irons "relics for museums." An appendix contains an account of Dr. Simpson's further work on the measurement of physiological efficiency with the Woolham-Flack methods, special emphasis being laid on the results of repeated tests; an unstable "wobbling" type occurs among the less fit. In practice the tests were found useful in selecting the boys to be allowed to swim.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 8TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 393 (last week 439); scarlet fever, 2601; diphtheria, 1720; enteric fever, 37; pneumonia, 1885; puerperal fever, 73; puerperal pyrexia, 114; cerebro-spinal fever, 17; acute poliomyelitis, 7; acute polio-encephalitis, 3; encephalitis lethargica, 14; dysentery, 34; ophthalmia neonatorum, 117. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on March 11th–12th was as follows:—Small-pox, 594 under treatment, 26 under observation (last week 602 and 23 respectively); scarlet fever, 2146; diphtheria, 2745; enteric fever, 13; measles, 1018; whooping-cough, 80; puerperal fever, 21 (plus 12 babies); encephalitis lethargica, 123; poliomyelitis, 1; "other diseases" 19. At St. Margaret's Hospital there were 8 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 4 (0) from enteric fever, 152 (59) from measles, 8 (4) from scarlet fever, 51 (7) from whooping-cough, 48 (12) from diphtheria, 42 (12) from diarrhœa and enteritis under two years, and 88 (12) from influenza. The figures in parentheses are those for London itself.

The fatal cases of enteric fever outside London were reported from Huddersfield, Bradford, Sunderland, and Newport (Mon.). Fatal cases of measles were concentrated at Portsmouth and Manchester each 12, Sheffield 9, West Ham 6, Blackburn 5. (Glasgow also reported 13 deaths.) Whooping-cough claimed 7 victims at Birmingham, 4 each at Middlesbrough and *Newcastle-on-Tyne*. No large town reported more than 3 deaths from diphtheria. Manchester reported 6 deaths from diarrhœa, Birmingham 4. The highest figures for deaths attributed to influenza were Hull 4, Brighton, Birmingham, Liverpool, and Middlesbrough each 3.

The number of stillbirths notified during the week was 203 (corresponding to a rate of 41 per 1000 births), including 41 in London.

Correspondence.

"Audi alteram partem."

ÆTIOLOGY OF DISSEMINATED SCLEROSIS.

To the Editor of THE LANCET.

SIR,—For several years I have thought that the *functional efficiency of the liver* is impaired in disseminated sclerosis, and in this respect my observations confirm those recorded by Miss Kathleen Chevassut in her important and interesting paper published in THE LANCET for March 15th. There is no doubt that the disease is often aggravated by childbirth, and sometimes its apparent onset or more frequently the occurrence of a period of activity is the immediate sequel of parturition. Dr. Gordon Holmes has noticed a similar result follow operations, even of a trivial nature. The common factor in childbirth and operations is the frequent use of chloroform, a well-recognised hepatic poison. I have also been impressed with the greater frequency of toxic symptoms following the injection of organic arsenical preparations in disseminated sclerosis than in other diseases, such as tabes. These observations led me to investigate the lævulose test in a small series of cases of disseminated sclerosis, and in the majority a slight but definite hepatic insufficiency was discovered. In one case the blood also gave an indirect van den Bergh reaction.

Apart from the possible connexion of hepatic insufficiency with the *Spherula insularis* described by Miss Chevassut, its presence is an indication that twilight sleep should be employed in place of chloroform when a patient with disseminated sclerosis is in labour, and that if an anæsthetic is required for any operation chloroform should never be used.

I am, Sir, yours faithfully,

ARTHUR F. HURST.

New Lodge Clinic, March 16th, 1930.

THE DRAFT POOR LAW ORDER.

To the Editor of THE LANCET.

SIR,—It is a little disappointing to find THE LANCET commending an Order which tends to establish and entrench the existing system of poor-law administration just at the time—indeed the only favourable time—for breaking away from it. It is difficult to imagine a more inaccurate description than your word "modernisation" for this anachronism. You point out yourself that the opportunity has been taken, as in Article 19, to generalise some of the duties of the Guardians which were formerly prescribed in detail, and it should also be noted that the Ministry have issued, on Feb. 11th, Draft Rules and Orders in relation to relief which materially change the old position. As regards officers, however, the Draft Order prescribes duties and conditions of service which may have been necessary and desirable sixty years ago, but which are not only out of date now but thoroughly objectionable under what was hoped to be a new system of administration. It is not too much to say that if the Draft Order in its present form became statutory some of the reforms which the whole medical profession have considered desirable could not be brought into effect.

The view of the Ministry of Health, I believe, is that there must be the least possible amendment of the old Orders until they have time to consider in collaboration with the new authorities what vital changes ought to be made at a later date. I suggest that in the present instance this is the wrong way to approach the subject. In these matters there is definitely a tide which has to be taken at the flood, and there is grave danger that the determination of the Ministry that the transfer of poor-law administration shall be carried out smoothly at all costs, may result in such an establishment of the bad features of the existing system that it will be very much more difficult a year or two hence to bring about locally changes which would now be accepted by the authorities and which the medical profession desire. It is wrong to say that "no medical officer of health or medical practitioner will find himself any the worse." If a change which was recognised to be more or less revolutionary, and which was threshed out for years before it was brought before Parliament and then established by statute and accepted by the public and its representatives, is found to be, in fact, no change at all, those who were supposed to be affected by it are in a weaker position than if the change had never been proposed.

I am, Sir, yours faithfully,
RALPH M. F. PICKEN,
March 15th, 1930. M.O.H. and School M.O., Cardiff.

THE MISSIONARY DOCTOR IN INDIA.

To the Editor of THE LANCET.

SIR,—I venture to ask the hospitality of your columns for a quotation just received from a young missionary doctor in India which will, I think, prove of interest to many newly qualified men and women. Dr. Ruth Bocock writes in her annual report:—

> "As I sit down to write this report there is one question uppermost in my mind, and this is, 'Why is it so hard to find a sufficient number of doctors to supply the needs of the mission field?' There are many answers, I know, to this query, but I am sure that one is that many people at home have a mistaken idea as to the conditions of medical work prevailing in India. When I first came out here, just three months after leaving my last English hospital, I did so with many misgivings. I was thoroughly in love with my work at home and very keen on all the latest advances and such like things. I had it well rubbed into me by all sorts of people that I was very foolish to throw up work in England, that the privations out here would be great from a medical point of view, and that the medicine I should have to practise would be very simple. My misgivings soon vanished into thin air; the routine in the hospital here I found to be very similar to that at home, and the diseases in many ways more varied and interesting. In less than a fortnight I found myself quite at home and realised that people who talk of doctors throwing up their careers by coming to India are very ignorant people."

Similar testimony could be borne by many from other countries as well, and the secretaries of any of the missionary societies in this country will be glad to hear from young doctors who wish for a very fine scope of service as a witness to the Christian faith.

I am, Sir, yours faithfully,
HUGH H. WEIR,
Secretary, Medical Missions Department, Society for the Propagation of the Gospel.
15, Tufton-street, S.W. 1, March 5th, 1930.

TENNIS ELBOW.

To the Editor of THE LANCET.

SIR,—I should like to congratulate Dr. Marlin on his brief yet very comprehensive paper in your issue of March 8th (p. 509). It seems to cover the whole ground on "Tennis Elbow" very effectively both as regards pathology and treatment, the former being largely hypothetical because of its varied causation. For the same reason the treatment is by no means stereotyped. In the typical tennis elbow which, in my judgment, is a fibrositis of the fascial attachment of the supinators to the external epicondyle of the right arm, and the typical golf elbow which is a fibrositis of the facial attachment of the supinators to the external epicondyle of the left arm, the treatment par excellence is manipulation. This consists in a hyperextension of the elbow joint, and is usually effected by a sudden movement at a single sitting without an anæsthetic. When this happy result fails to supervene, the case is not typical and is complicated by some other factor such as rheumatism, gout or traumatism. It is in such cases that diathermy, radiant heat, static electricity, or sometimes even surgical intervention is required.

I cannot help expressing the greatest surprise at the continued apathy of the medical profession in connexion with the subject of manipulative therapeutics. I know not whether I have been endowed with more than my share of tactile sensation, but I do know that from the very beginning of my medical career, close upon half a century ago, whenever I failed to cure a patient with the ordinary medicinal and other remedies, I always endeavoured to effect a cure by the use of my hands, not infrequently with excellent results. I am not at all surprised at the success claimed by the so-called osteopath in many cases which have baffled the regular medical practitioner, because the latter deliberately fails to recognise or even look for the real cause of the trouble. I have a strong suspicion that the average medico regards it as infra dig to use his hands on a patient. He confuses manipulation with massage, which he regards as a menial occupation only to be relegated to the bath attendant or other type of unsophisticated person. And yet, in THE LANCET of March and April, 1871, Wharton P. Hood, M.D., M.R.C.S., gave a description of what was commonly called "bone-setting." And we must never forget that it was four years subsequent to this date when another fully qualified medical man laid the foundation of the so-called science of osteopathy, which he claimed to be the only rational system of medicine.

Elsewhere[1] I have controverted this idea.

> "If it be a system of medicine, at the best it is purely a system of one idea. Its nosology is a lesion; its symptomatology, a subluxation; its therapeutics, manipulation; whilst its pathology is accommodating enough to cut both ways, the subluxation being either the cause or the effect of departure from function. . . . Despite these limitations, however, as a method of treatment it serves a useful purpose not only in emphasizing the value of manipulation in disease, but in laying stress on cases which have previously been ignored or undiagnosed by the profession."

I wrote these words in 1910, and I can only add that from my increased experience I am more than ever satisfied that in manipulative therapy we have a valuable method of curing many cases otherwise incurable. I do not hesitate to plead for the admission of this new form of scientific bone-setting among the recognised methods of treatment practised by the medical profession.

I am, Sir, yours faithfully,
ALEXANDER BRYCE, M.D., D.P.H. Camb.
Birmingham, March 17th, 1930.

THE ENDOWMENT OF PATHOLOGICAL RESEARCH AT WESTMINSTER HOSPITAL.

To the Editor of THE LANCET.

SIR,—I write on behalf of my uncle Mr. A. J. H. Carlill, who in 1924 endowed the work of pathological laboratories at Westminster Hospital in order to commemorate the life of his father Dr. John Burford Carlill, to ask you to allow him to express to Miss K. Chevassut his congratulations on her research into the cause of disseminated sclerosis. If in 1924 we at Westminster Hospital had cause for congratulating him and ourselves that his munificent gift was made during his life, Miss Chevassut's work, apparently of far-reaching importance and done in the few years which have elapsed since 1924 and also during his life, must be a source of the greatest possible gratification to him. My uncle is on holiday in Australia.

A few points stand out on the clinical side. Miss Chevassut's discovery of the "specific" organism appears likely to enable us to diagnose the disease with certainty. Formerly a firm clinical diagnosis was by no means always easy, especially in early cases, and I may point out here that routine examination discloses for example abolition of epigastric and abdomina reflexes in a number of young people who claim n symptoms which are even suggestive of disseminate sclerosis and who appear never to have the disease Miss Chevassut's discovery helps us also in the diag nosis of those often very difficult cases of coexisting disseminated sclerosis and hysteria. Lastly, we are now able to recognise with precision "cure" as distinct from remission, although we shall not expect every abnormal physical sign to disappear in cases of "cure." In a recent case of my own in which the prominent signs were an alternating hemiparesis and also palsy of a sixth cranial nerve almost complete clinical recovery from an illness which had lasted for two and a half years occurred within six months of treatment, and the cerebro-spinal fluid which was bacteriologically affected prior to treatment became sterile within the same six months. The only treatment was a single course of vaccine administered intravenously.

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[1] Brit. Med. Jour., Sept. 3rd, 1910.

Future clinical workers should bear in mind the very real necessity of making thecal punctures which are perfect, and therefore painless. Arsenical injections, our stand-by in the recent past, should not be given to patients who are to be investigated by Miss Chevassut's methods. Permit me please to end this letter with an expression of my own congratulations to Miss Chevassut and to her co-workers in the John Burford Carlill laboratories.

I am, Sir, yours faithfully,
HILDRED CARLILL, M.D. Camb.,
Physician and Lecturer on Nervous Diseases, Westminster
Hospital and Medical School; a Trustee of the
John Burford Carlill Pathology Fund.
Harley-street, W., March 15th, 1930.

ÆTIOLOGY OF ENCEPHALOMYELITIS FOLLOWING SMALL-POX.

To the Editor of THE LANCET.

SIR,—As Dr. Troup and Dr. Weston Hurst have raised the question of the ætiology of encephalomyelitis following small-pox (THE LANCET, March 18th, p. 566), might we be allowed to comment on their conclusions? In their article, Drs. Troup and Hurst describe in detail a case of encephalomyelitis following small-pox, and show that the pathological lesion is essentially similar to that of post-vaccinial encephalitis; this they assume as indicating the awakening of some mysterious latent infection in both conditions. It seem to us that the reverse is the case, and that their essential similarity is strongly in favour of the fact that both conditions are due to the virus of variola. They also draw attention to the encephalitis which has been described as a complication of measles.

Time and space will only allow us to mention a few of the facts which can be adduced to refute their contention, quite apart from the all-important fact that so far no virus other than that of the disease has been isolated from these cases of encephalomyelitis.

It is well recognised that very similar histological lesions may be produced in ordinary tissues by different ætiological agents, as, for instance, in the case of syphilis and tuberculosis. Then how much more likely in the brain, where the type of reaction is necessarily limited, are similar histological lesions likely to be produced by different viruses; although certain well-marked types of lesions can be differentiated. But the encephalitic conditions with which we are dealing are mainly found in the later stages of general exanthematous diseases (variola, vaccinia, measles, &c.), the viruses of which are likely to have very similar actions. In typhus fever, for example, cerebral involvement is so frequent as to be reckoned part of the disease, and no latent virus can be postulated, yet the histology of the lesion is comparable with that of post-vaccinal encephalitis. Again, on the development of nervous symptoms in syphilis, no matter at what stage, there is no suggestion that a latent virus is at work. Lastly, clinical experience has in general shown that it is unwise to assume without adequate evidence an infection by more than one organism, and in the instances mentioned the evidence is definitely against such an assumption.

No new reason or fact, therefore, has been brought forward by Drs. Troup and Hurst to indicate that the encephalitis in variola and in similar condition is not produced by the actual virus causing the exanthematous disease.

We are, Sir, yours faithfully,
JAMES McINTOSH,
R. W. SCARFF.
The Bland-Sutton Institute of Pathology, Middlesex
Hospital, W., March 18th, 1930.

PROTECTION AGAINST MEASLES.

To the Editor of THE LANCET.

SIR,—Allow me to endorse Dr. Hugh Barber's letter in your last issue. Several disastrous epidemics in preparatory schools have come under my notice and, in every case, the children are moved to the sick ward and it has been a frequent experience to see every window wide open, the children washed twice daily, and fed, more or less forcibly, with milky foods. It is under these conditions that broncho-pneumonia and mastoids are so frequent. On the other hand, where a child is at home, is put to bed at the onset of fever in a warm room, given plenty to drink and only the food it desires, the attacks are almost always mild and the temperature normal at the end of the fifth day. I believe most sincerely that the less exposure the better. There is no necessity whatever to stethoscope the child and, certainly in the winter-time, the window should only be open sufficiently to keep the room aired, and the temperature should be at least 62° F. with the child carefully protected from cold draughts.—I am, Sir, yours faithfully,
H. BECKETT-OVERY, M.D., F.R.C.S.
London, March 18th, 1930.

Obituary.

HENRY WILLIAM ARMIT, M.R.C.S. ENG.

We regret to announce the death in Sydney, New South Wales, of Dr. H. W. Armit, which occurred on March 12th, at the age of 59. He was until recently editor of the *Medical Journal of Australia.*

Henry William Armit was the son of the late William Armit, secretary to the Hudson Bay Company, and received his medical education at St. Bartholomew's Hospital, taking the London double qualification in 1894. He was for a time, after qualification, assistant medical officer at the Eastern Hospital of the Metropolitan Asylums Board, and was afterwards attached to the Lister Institute, but his knowledge of languages, mainly, led him to become a medical journalist. For this he was fitted, as he had, in addition to his practical knowledge, a broad outlook on professional questions. His services were largely used by the *British Medical Journal* as their representative at continental gatherings, and in this capacity he attended the International Congresses at Berlin in 1901 and 1907, at Paris in 1905, at Lisbon in 1906, at Cologne in 1908, and at Budapest in the following year. He was also for a time the London correspondent of the *Berliner Klinische Wochenschrift*, while his services were frequently used by THE LANCET as a topical correspondent. He was, as may be gathered, a good German scholar, and found time, in addition to his journalistic work, to translate two German books: one, the well-known book by Ehrlich and Lazarus, and the other a work by Professor von Schrötter, of Vienna, entitled the Hygiene of the Lung.

Just before the outbreak of war the *Medical Journal of Australia* came into existence, replacing two magazines, one of which was published in Sydney, and the other in Melbourne, and Armit went out, by invitation, to take the post of editor. The time was a difficult one for running what was practically a volition. He hoped the Minister as soon as the Bill reached the Statute Book would exercise to the full his powers to see that rules and regulations were passed which would really safeguard the people who were placed under control in the manner provided by this Bill.

The clause as amended was added to the Bill.

The Committee adjourned.

The Mental Treatment Bill was further considered by Standing Committee A of the House of Commons on Tuesday, March 18th. Mr. CECIL WILSON was in the chair.

Powers and Duties of Local Authorities.

On Clause 6 Mr. GREENWOOD (Minister of Health) moved an amendment in order to make Subsection (1) read as follows:—

> "It shall be the duty of every local authority to investigate the needs of their area and to take such steps as they consider necessary to provide and maintain suitable accommodation for the reception of temporary patients under the last foregoing section of this Act."

He said that he would have preferred the Bill to remain as it was, but he was very anxious to meet the wishes of the local authorities as far as possible, and to secure their goodwill, and therefore he had agreed to this amendment. But he had pointed out to the County Councils Association that under Section 104 of the Local Government Act it would be quite possible for the Minister to reduce the block grant to local authorities which failed to institute and maintain a reasonable standard of progress in relation to public health services. By a later section of the Local Government Act it was stated that this provision applied to lunacy and mental deficiency. The local authorities would be required to make their own investigation of their needs, and to take steps to put their own plans into operation. Whether the authorities would suffer financially depended on the circumstances. He had no intention or desire to bully local authorities; his powers would only be exercised in this matter when he could justify them to Parliament.

The amendment was agreed to.

Mr. GREENWOOD moved an amendment to the effect that a local authority should have power, subject to the approval of the Board of Control, to contract for the reception and treatment of temporary patients in any registered hospital, or any institution, hospital, or nursing home, approved by the Board of Control.

The amendment was agreed to.

Board of Control and Local Authorities.

Mr. GREENWOOD moved the first of a series of amendments which he said were designed to give greater freedom to local authorities from interference by the Board of Control, except in respect of research. It was desirable that the Board of Control should retain its powers in that regard in order to secure the maximum amount of coöperation, to avoid duplication, and to produce the best results. These amendments were of considerable importance, and had been framed after consultation with the County Councils Association in order to meet their views.

Lieut.-Colonel FREMANTLE said while he agreed that it was necessary to give the utmost possible liberty to the local authorities in this matter, which was consistent with the coöperative working of the whole machine, he was not altogether pleased with the removal of the approval of the Board of Control under the amendments before the Committee. If the Board worked sensibly, it was desirable that they should have supervising power over the whole of this machine. He therefore thought that the Bill as originally drafted was right, but as the County Councils Association has taken up this line it was expedient to meet their views. He hoped, however, that the county councils would enable the Board of Control to work the whole machine as they would have done if the Bill had remained unaltered. He was very glad that the Board of Control were to retain in their hands the matter of research. A great deal of money was being wasted under the heading of research in this country to-day, and it was necessary to be careful in order to prevent the word research being used as an excuse for spending money. It was necessary to see that research was coördinated and that overlapping was prevented.

Dr. MORRIS-JONES associated himself with the remarks of Colonel Fremantle. He could not understand the tremendous fear which existed in regard to the Board of Control. The Minister had been very conciliatory, and he was not quite sure that in time it would not be discovered that the right hon. gentleman had been too conciliatory in this matter. He would have thought that local authorities would have welcomed a certain measure of approval coming from an expert body like the Board of Control.

Sir DOUGLAS NEWTON congratulated the Minister on his courage in making this considerable alteration of the Bill to meet the reasonable representations of the County Councils Association. Local authorities in the past had been very irritated by the interference of the Board of Control in these matters, especially in view of the fact that the Exchequer did not find any of the cost. He was anxious to know whether the new freedom accorded to local authorities included questions relating to buildings used in connexion with mental treatment.

Mr. GREENWOOD said that no doubt local authorities would like to revise the whole of the system of central controls set up under the principal Act, but that could not be done under this Bill. The new freedom being accorded to the authorities applied to this section alone, and if the local authorities meant more than that they were trying under the guise of an apparently innocent series of amendments to make a fundamental change in lunacy administration laid down in the principal Act. The position in regard to buildings was unaltered by these amendments. The control of the central authority set out in Section 254 of the principal Act remained in operation. He would like to remind the Committee again that this Bill did not deal with the larger problems of lunacy administration provided for in the principal Act.

The amendments were agreed to.

Other Amendments.

Mr. KINLEY moved an amendment to limit the expenditure under Subsection (4) of Clause 6 to the proceeds of a halfpenny rate. He said that the local authorities to-day were heading towards bankruptcy. Year by year Parliament was throwing upon them increased financial burdens which their resources were not expanding to meet.

Mr. GREENWOOD said that while it was quite true that no one could say at present what the expenditure would amount to under this measure that was also true of most social legislation which had been passed. It was in any case very difficult to limit by Statute the expenditure of local authorities in the way proposed by this amendment.

The amendment was negatived.

Mr. GREENWOOD moved an amendment which he said was necessary in order to bring the new transferred institutions which the local authorities might use under the Local Government Act for the purpose of mental treatment under the same rules and regulations as applied to the other institutions which were already used for that purpose.

The amendment was agreed to.

Mr. GREENWOOD moved an amendment providing that the Asylums Officers' Superannuation Act, 1909, should have effect as if for references therein to mental hospitals there were substituted references to institutions maintained by local authorities.

The amendment was agreed to.

Clause 6 as amended was added to the Bill.

The Committee adjourned.

EYE TESTS FOR MOTOR DRIVERS.

The Road Traffic Bill was considered by Standing Committee C of the House of Commons on Tuesday, March 11th. Sir HUGH O'NEILL was in the chair.

Provisions as to Physical Fitness of Applicants for Licences.

On Clause 5 Dr. SALTER moved an amendment to Subsection (1) providing that an applicant for a licence should produce a certificate showing that he had satisfactorily passed an eyesight test as to visibility and colour. He said that he gathered that it was the intention of the Minister of Transport when this Bill became law that every applicant for a licence should make a declaration of a somewhat elaborate character as to whether he was suffering from certain physical disabilities. He also understood that the Ministry of Health had drawn up a form, and that the list of the said disabilities was quite lengthy. From his (Dr. Salter's) point of view, any such declaration was quite useless, especially in regard to conditions affecting the eyesight. There were large numbers of people suffering from grave visual defects who were quite unaware of any defect, and could quite honestly make a declaration that they were physically fit and capable of driving, and at the same time they might be extremely dangerous persons when in charge of a motor vehicle on the road. The only safeguard was to insist that everyone should produce an appropriate medical certificate in the prescribed form. During the past week he had had conversations with four or five of the most experienced and distinguished ophthalmic surgeons in London. They all told him that they had seen people suffering from grave eye trouble in the last year or two, and the first intimation that those people had that they had a visual defect was when they met with an accident while driving a car. Enormous numbers of drivers had got defective eyesight and no one knew for how many accidents they were responsible.

Four Classes of Visual Defectives.

There were at least four classes of persons suffering from visual defects who ought not to be permitted on the roads at all. The first was the class of people with extreme myopia. There had been a considerable number of dangerous driving cases where men had put up a plea that it was due to shortsightedness. In the Tiverton division last year a man put up such a plea and he was fined £5 and his licence was suspended for 12 months. But his eyesight would not be better after 12 months. In a letter to the *Times* the editor of the *Optician* pointed out that there was a growing practice, not only of having colour signals for the direction of road traffic, but also various forms of semaphore, and that the size of the letters forming the word "stop" on a revolving signal were visible only to drivers with a good standard of vision. At least one driver in 100 failed to see this signal. Again, there were thousands of cases where people had put forward the excuse that they were unable to read the particular sign exhibited for their guidance. The second class of person who ought not to be allowed to drive, at any rate after dusk, was the person who suffered from night blindness. There was a very large proportion of people, certainly not less than 5 per cent. of the population, who suffered from night blindness—that was to say, they either could not see at all in the dark, or their vision was extremely defective. There were people, on the other hand, whose vision was better in the dark than it was by day. There was an increasing proportion of accidents at night and after dark, to which the London and Home Counties Traffic Advisory Committee called the attention of the Minister in their recent report. In the report on street accidents in Greater London, March, 1927, it was pointed out that the percentage of persons killed by motor vehicles by day had gone down from 77·5 to 68·5, whereas the percentage killed at night had gone up from 22·4 to 31·5; those injured by day had gone down from 83·6 to 76·3, and those injured by night had gone up from 16·4 to 23·6. It was only right that persons should be duly certified as physically fit to drive at night. Another class of person was that suffering from various diseases of the eye itself, and the central nervous system, whose field of vision was obscured or completely blotted out at places.

It was an interesting fact that a great many of these people first sought medical advice for diseases of the central nervous system, like disseminated sclerosis and locomotor ataxia, because they had discovered the defect through having met with an accident. They ought not to be allowed to drive on the roads. There was a certain type of person who, with the passage of years, suffered from a steady diminution of the circumferential area of the field of vision. At least one Member of the House of Commons had told him that he was obliged to give up driving because he could only see straight in front of him. That was a matter which led to accidents and prevented a driver seeing cars coming out of side roads. There was a still more important visual defect which would grow in importance in coming years if the present system of regulating traffic by means of signals was extended.

Automatic Colour Signals.

It was clear that the Minister of Transport was encouraging all the great towns to establish automatic colour signals. There could be no dispute, however, that many thousands of people were totally colour blind. Swansey, in his authoritative work on diseases of the eye on page 10, said :—

> "A certain proportion of people, 3·5 per cent. of men and about 1 per cent. of women, are congenitally colour blind in greater or less degree."

These people could not possibly obey the signals. As a matter of fact people had been charged with overrunning the colour signals—he believed in Derby and other northern towns—who pleaded that they were colour blind. The railway companies discovered that at least 2·2 per cent. of men examined for the post of driver or fireman were practically colour blind. It was a remarkable fact that a man might pass a colour test one year and five years later it might be found that his colour vision was defective and he had to be displaced. In Germany a strict medical test was enforced. An official doctor had to be engaged at a fee fixed by the State, and within the last 12 months in Prussia a compulsory test for colour blindness had been included. If Parliament was desirous of protecting the public from accidents on the roads and of safeguarding human life it was essential that tests for sight should be imposed and a proper certificate submitted.

Lord ERSKINE submitted that the words of the amendment were really redundant. If a man was so extremely shortsighted that he could hardly see at all he imagined that that would be one of the disabilities included under the clause. Colour blindness was a very unfortunate thing, but he did not think that they could say that because a man happened to be colour blind he should be debarred from driving. If they were going to have this system of lights they must make some provision for those who were colour blind, because he understood that disability was increasing.

Major HILLS said he hoped that something could be done in the direction of the amendment.

A Standard of Shortsightedness.

Mr. HERBERT MORRISON (Minister of Transport) said he did not want to make the absolute bars to receiving a licence too numerous, because there was a whole field of diseases or disabilities where there was an element of doubt. But certainly he would regard extremely short sight as one of the disabilities which would be specified in the form, and would be an absolute bar to the grant of a driving licence.

Lord ERSKINE: Uncorrected by spectacles?

Mr. MORRISON said that even with spectacles, if a man were still definitely shortsighted, that would be an absolute bar to driving.

Dr. SALTER asked the Minister up to what point he put the limit? Was it 25 per cent. or 50 per cent. of the normal vision?

Mr. MORRISON said he could not get as far as that point at this stage, but the standard would be laid down in the form, and it would be for the applicant to satisfy himself that his sight reached that standard. But it was not proposed that applicants should produce any form of medical certificate. There were two ways in which the medical certificate could be dealt with. The applicant could go to his own medical adviser or ophthalmic surgeon—but with great respect to the profession there would not be complete reliance that medical certificates were always given in strict accordance with the facts when perhaps a man's employment might depend on the result of the certificate. The alternative method would be that there should be doctors in the public service who would be employed on this work. He was suspected, during the Second Reading of the Bill, of intending to appoint an army of officials, but he was afraid he would have to appoint such an army of officials if all that work was to be done. Therefore that scheme seemed to him to break down. It must be remembered that a man who made a false declaration was liable to very severe penalties—namely, £50, or six months' imprisonment or both. If a man knew that and also that he might be involved in an accident because of a defect which he did not declare he would be very careful about making false declarations in his application for a licence. In Subsection (4) of Clause 5 of the Bill it was provided that a licensing authority which suspected that a man was suffering from a disease or physical disability, either at the original granting of the licence or at any subsequent time, might revoke the licence. Therefore there was a running check all the time. If the purpose of this amendment was to be met there would have to be a medical examination on the granting of the first licence, and every year on its renewal. That would involve the appointment of an army of medical men and cause irritation and trouble to the drivers in having constantly to undergo these tests. As to the light signals, a man who was colour blind could at any rate in the daytime see the position of the light. The positions would be regular, and drivers would know whether it was the first, second, or third light. The same men would be able normally to read the word "stop," "go," or "caution"; and there was therefore a check there. Finally, the man who knew that he was defective in this regard and might get into difficulties would probably have someone with him who would be able to point out these things. He agreed that this was not a completely satisfactory assurance, but it was sufficient to warrant the Committee in not imposing conditions which would be vexatious and irritating to a large and eminently respectable section of the community who would resent these numerous tests. The clause as it stood was reasonable and went as far as they could go at the moment.

Mr. GEORGE OLIVER said he was authorised to say that the people employed in driving commercial and passenger vehicles viewed this amendment with grave apprehension. If the tests outlined that day were to be applied there was hardly 1 man in 100 who would escape.

The amendment was rejected by 44 votes to 4.

Driving Tests.

Mr. D. HALL CAINE moved that applicants for licences should be required to satisfy the licensing authorities of their competency to drive with reasonable skill, and of their knowledge of the rules of the road. He said this country had by far the largest proportion of accidents compared with any other, and it was practically the only country where there were no driving tests. The standard of driving in this country was bad.

Lieut.-Colonel HOWARD-BURY said that driving tests in other countries were in most cases an absolute farce. The dangerous drivers who took risks would be able to pass all the tests and the Royal Commission had pointed out that a very small percentage of accidents was caused by inexperienced drivers.

Mr. Morrison said the Ministry of Transport and the local authorities could appoint large numbers of officers to administer driving tests; but it was doubtful if Parliament would assent to the expenditure involved, and the question arose whether the results of the tests would be worth the money spent on them. The tendency would be for the tests to be perfunctory. The person who they wished to get at was the dangerous driver who would be able to pass all the tests with ease.

The amendment was rejected by 36 votes to 10 and Clause 5 was then agreed to.

MEDICAL OFFICERS FOR THE NAVY.

On Monday, March 17th, Mr. Alexander, First Lord of the Admiralty, in moving that the House of Commons go into Committee on the Navy Estimates, said that the Medical Director-General had reported that the health of the Fleet personnel had been very good for the past 12 months, and no serious epidemics had occurred. Some concern was felt, however, by his advisers in regard to the difficulty of obtaining an adequate supply of medical officers in spite of the very special efforts made during the past 12 months by the Medical Director-General. As the medical profession was not without some direct representation in the House of Commons, he hoped that they would be able to use some influence in the direction of assisting the Admiralty on this matter.

Welfare of the Sailor.

Very substantial provision was now made for the welfare of the men, which was a great factor in maintaining general health and efficiency. The pressure of preliminary naval negotiations and the Conference itself had prevented him (Mr. Alexander) from giving the amount of personal attention which he would like to this side of the Admiralty's activities, but the welfare work had been going on well, and in the conferences which were to meet shortly, opportunity would be given for new suggestions to be considered. He was much impressed in the course of a short visit to the Atlantic Fleet, during the autumn exercises, with the general fitness, keenness, and efficiency of the men in the Service, and it was not surprising that they were welcomed in countries all over the world.

The Vote for personnel was afterwards considered in Committee.

Major Ross said that it appeared that nearly all the stores were being reduced—victualling, clothing, and even medical.

Mr. Alexander pointed out that he had explained that he had to meet commitments this year made by his predecessor, a large proportion of which was in respect of additional stores.

Major Ross said that the Navy Estimates showed that there was a large decrease in stores. There were reductions in medical and surgical stores. The sum provided by the First Lord for the provision of medical stores and surgical appliances had been reduced by some £11,000, and he suggested that the First Lord was not keeping the stocks which had been supplied up to the standard. It seemed to him that the stores were being cut dangerously low.

Shortage of Medical Officers.

Dr. Vernon Davies said that the First Lord of the Admiralty, in his statement to the House, showed that he was rather perturbed at the lack of medical officers. He was reducing the personnel of the Navy by 2750, and he had said that he could not understand why the medical services, not only of the Navy but the Army, were not more popular. He (Dr. Davies) suggested that probably the terms were not quite good enough, and yet the terms were very good. The First Lord had visualised a time when boys from elementary and secondary schools would pass through the university and into the Services of the Crown. They were doing that now in the medical profession, and that was the difficulty that they were up against. If he might say so, without offence, medicine was becoming more of a trade and less of a profession. Many of these young men had no money; they had spent all their money on their education. They had become qualified and were out to do the best they could for themselves. They had several opportunities before them in civil life. A young doctor could set up in a national health insurance panel practice, and there were other openings, but if he went into the Navy, even on the short service system, though he could go out with a gratuity of £1000, he had to give three years or five years of his life. He had to go abroad. He dare not get married because the Admiralty would not give him a pension. On the other hand, those who did not go into the Service but stayed at home could earn as much money; they could get married and enjoy home life. They had before them specialised services, such as tuberculosis service, school medical services, and others in which they could work for six or seven hours a day on five days of the week, and earn from £600 to £900 a year. With that prospect on shore, why should a young doctor go to sea? He would be very silly to do so, unless he had a great love of the sea. The First Lord might make up his mind that the medical services of the Crown would have to be amalgamated. It was no use asking the heads of the separate medical services to agree to such a proposal, because they were not going to commit hara-kari.

Preferential Claim on Crown Appointment.

The Government would have to make up their minds that when they wanted medical men they were in competition with the great civil medical services of the country, both national and municipal. His (Dr. Davies's) suggestion, for what it was worth, was: Would it not be possible to give to men who had served in one or other of the Services for five years a preferential claim on all medical appointments under the Crown, or under the municipalities? It really was a question of choice between a man who had given five years of his life to the service of the country voluntarily and the man who had stayed at home. When the Government wanted a medical man for a post under the Ministry of Health, or any other Department, the man who had served his country for five years should have a preferential claim. By offering an inducement like that they would get these young men into the Service. Unless they had an efficient medical service they would not get a healthy Navy; if they did not get a healthy Navy they would have an inefficient Navy, and, as would be remembered, it was the medical men who won the war. There was never a war in all history where there was less sickness and disease, or where more people were cured after being disabled. It was the medical profession, absolutely, which won that war by keeping the men fit. It was no use having the ships unless the men were healthy and fit; and he hoped that the First Lord would not be discouraged at the lack of entries into the medical service, but would recognise that there were more tempting offers made outside, and that it was up to his Department to see if they could not make the Service more attractive to these men.

The Vote was agreed to.

HOUSE OF COMMONS.

WEDNESDAY, MARCH 12TH.

Institutional Accommodation for Mental Defectives.

Dr. Vernon Davies asked the Minister of Health the number of local authorities who had provided any accommodation for mental defectives, the number who had failed to do so, and the estimated number of mental defectives for whom no institutional accommodation was available.—Miss Susan Lawrence (Parliamentary Secretary to the Ministry of Health) replied: Twenty-nine out of 1924 local authorities (or combinations of authorities) have made some provision for the residential care of the mentally defective. As my right hon. friend stated in reply to a similar question on Dec. 19th, the present accommodation is inadequate; and if the figures estimated by the Departmental Committee on Mental Deficiency be accepted, the shortage of beds would probably be approximately not less than 20,000.

Repair of Hospital Ship "Maine."

Sir Robert Gower asked the First Lord of the Admiralty whether he would consider the desirability of placing the order for the construction of the contemplated new hospital ship with the Royal Naval Dockyard at Chatham.—Mr. Alexander replied: No new hospital ship for the navy is included in the present programme of new construction; but the existing hospital ship *Maine* is now undergoing large repair at Chatham dockyard.

Government and the Factories Bill.

Sir Kingsley Wood asked the Prime Minister whether he proposed to give facilities this session for the Factories Bill.—Mr. Snowden (the Chancellor of the Exchequer) replied: I regret that in the present state of public business I am unable to say when this Bill can be introduced.

Silicosis and Disablement.

Mr. Kelly asked the Home Secretary how many cases of disablement from silicosis were reported in 1929; the number partially disabled, with the number permanently disabled; and the number of fatal cases.—Mr. Clynes replied: The only complete figures I can give at present for 1929 are those of cases dealt with under the Compensation Schemes for silicosis in the refractories and sandstone industries. Under the Refractories Scheme there were 18 cases of partial and one case of total disablement, and ten fatal cases. Under the sandstone scheme (which came into force only on April 1st last) there were two cases of partial and seven cases of total disablement, and five fatal cases. The figures for the industries included under the other two schemes now in force are not yet available, but roughly 100 cases in these industries—about half of which were fatal—have come to the notice of the Department.

THURSDAY, MARCH 13TH.

Alleged Interruption of Antivivisection Meeting.

Mr. FREEMAN asked the Home Secretary whether he was aware that at a public meeting held in the Friends Hall, Euston-road, W.C., on Thursday, Feb. 27th, 1930, to protest against the use of poison gas in experiments on dogs, there was an organised attempt to interrupt the meeting by medical students in spite of the efforts of from 20 to 30 policemen and about 40 stewards; and whether he would take measures to see that such meetings were protected from disturbance.—Mr. CLYNES replied: No, Sir, my information is quite different. A number of police were available but their assistance was not called for or required, and I am informed that the stewards had no occasion to take action against interrupters.

Medicated Baths and Rheumatism.

Mr. LEE asked the Minister of Health whether he was prepared to make grants to enable urban district or county councils to provide medicated baths for the treatment of rheumatism and kindred complaints at such public baths or hospitals as might now be in existence, or to erect special baths for the purpose.—Mr. GREENWOOD replied: I have no funds at my disposal from which grants could be made for this purpose.

The Treatment of Rheumatism.

Mr. GRAHAM WHITE asked the Minister of Health whether in view of the suffering and loss of national efficiency due to the incidence of rheumatic diseases, he would set up a committee to consider the best means of extending facilities for treatment and making a comprehensive attack on this evil.—Mr. GREENWOOD replied: Until further experience has been gained of the treatment of rheumatism at the new clinic established by the British Red Cross Society and elsewhere, I think it would be premature to consider the appointment of a committee for the purpose referred to by the hon. Member. But I shall be prepared to give sympathetic consideration to any practicable proposals which may be submitted to me by local authorities for the provision of facilities for treatment.

Institutions for Mental Patients.

Mr. KINLEY asked the Minister of Health the number of establishments in which lunatics were treated and the number of patients therein, showing the positions of those under local authority and private ownership, respectively.—Mr. GREENWOOD replied: The table indicates the number of institutions in which persons of unsound mind (voluntary and certified) are received, and the number of patients (voluntary and certified) under care on Jan. 1st, 1930, in England and Wales:—

Number of Institutions	Type of institution.	Number of patients resident.
(1) .. 99	County and Borough Mental Hospitals	117,486
(2) .. 14	Registered Hospitals	2,493
(3) .. 54	Licensed Houses	2,964
(4) .. 1	Royal Naval Hospital	115
(5) .. 1	Military Hospital	37
(6) .. 1	Criminal Asylum	827

(1) Provided by local authorities.

(2) Supported wholly or partly by voluntary contributions, or by charitable gift or bequest or by applying excess of payments of some patients for or towards support, provision, or benefit of other patients.

(3) Institutions under private ownership.

(4), (5), (6) Provided by the Admiralty, War Office, and Home Office, respectively.

Beds in Wells Mental Hospital.

Mr. GOULD asked the Minister of Health the largest number of beds in any one room now in use in the Wells County Mental Hospital, Somerset.—Mr. GREENWOOD replied: There are 75 beds in one dormitory of a size which gives 600 cubic feet of space for each occupant.

Mr. GOULD: Does the right hon. gentleman regard the mass sleeping accommodation as conducive to the best interests of the patients?

Mr. GREENWOOD: Unfortunately it is the best accommodation that they have at the moment.

Mr. GOULD: Will the right hon. gentleman make representations to the Wells Mental Hospital asking them for an early change in the dreadful conditions of the sleeping accommodation?

Mr. GREENWOOD: I will consider that suggestion.

Medical Officers in Poor-law Institutions.

Sir NICHOLAS GRATTAN-DOYLE asked the Minister of Health whether he had received any protests respecting the terms of his recent order affecting the relations of the master and medical officers in poor-law institutions.—Mr. GREENWOOD replied: The order to which the hon. Member refers has not yet been made, but has been published as a draft. I have received a number of representations in regard to the draft order which will receive my careful consideration.

The Virus of Psittacosis.

Mr. GRAHAM WHITE asked the Minister of Health if he could confirm the reported discovery and isolation of the virus of psittacosis at a London hospital.—Mr. GREENWOOD replied: The results obtained at this hospital have not yet been confirmed, but a great deal of work with the object of elucidating this disease is in progress, and I am hopeful of valuable results being obtained.

Lunacy Observation Wards.

Mr. ROBERT RICHARDSON asked the Minister of Health what would be the position of the lunacy observation wards, which at present formed a part of the poor-law infirmaries, after the poor-law guardians had been abolished; and would they be annexed to asylums or to voluntary hospitals.—Mr. GREENWOOD replied: The position of the observation wards will depend mainly upon the decision of the local authority in regard to the purposes for which the infirmary will be used; but I would remind my hon. friend that a provision is contained in the Mental Treatment Bill now before the House which will facilitate the use of these wards for mental patients.

Children in Poor-law Institutions.

Mr. JOWETT asked the Minister of Health the number of children of school age in poor-law institutions, including cottage and other children's homes, on the most recent date for which the information was available.—Mr. GREENWOOD replied: The number of children between 3 and 16 years of age in England and Wales in receipt of relief in poor-law institutions, including cottage and other children's homes and other separate establishments for children on the night of Jan. 1st, 1929, was 38,476. The returns received in my department do not distinguish children of school age.

MONDAY, MARCH 17TH.

Price of Quinine in India.

Major GRAHAM POLE asked the Secretary of State for India whether his attention had been drawn to the statement of the director of the botanical survey of India, in his report for 1928–29, to the effect that the poor in India were unable to purchase quinine at the price at which it was being sold in India, and that charitable dispensaries had to turn malaria-stricken patients away empty or with inadequate doses; and whether, in view of this position, the Government of India were taking any steps to reconsider its policy in regard to the cultivation of cinchona in India and the manufacture and distribution of quinine.—Mr. WEDGWOOD BENN replied: I have not seen the report referred to, but am asking the Government of India for an up-to-date report on the position.

Safety of British Hospital at Nanning.

Sir KINGSLEY WOOD asked the Secretary of State for Foreign Affairs whether he would make inquiries concerning the safety of some 20 girls attached to the Bible Churchmen's Girls' Orphanage, near Lungchow, which was recently looted by Communists; whether he would ascertain, in view of the safety of the occupants of the British Bible Churchmen's Hospital at Nanning, what was the present position there; and whether there had yet been any invasion by Soviet forces in this district.—Mr. HENDERSON replied: I have already made inquiries, and from such information as I have been able to obtain it would seem that the girls in question, who are Chinese, have been released. There is a scarcity of news from Nanning where the hospital in question is situated, but according to the latest reports foreigners are not thought to be in danger there at present, though unsatisfactory conditions prevail in the province generally. There has been no invasion by Soviet forces. The nearest point in this district to Soviet territory is about 2000 miles from the Soviet frontier.

Protection of Civilians against Gas Attack.

Mr. DAY asked the Prime Minister whether any decision had been come to with reference to the problem of the protection of the civil population against gas attack; whether any scheme had been prepared for the protection of the civil population in these emergencies in future; and whether this scheme had been communicated to the local authorities.—Mr. MACDONALD replied: As I have said in answer to previous questions on this subject, in view of the ratification, last year, of the Geneva Gas Protocol of 1925 by most of the important European States, including this country, and also in view of the other international undertakings and agreements for the preservation of peace, I do not think the present time opportune to press on with plans dealing with gas attack. It is, I think, well known, and has been stated in the House on more than one occasion, that considerable preparatory work had been done by the Committee of Imperial Defence upon this problem prior to the ratification of the Protocol. This work will always be available should it be necessary, at any time, to reconsider our position.

Disease Germs in Telephone Mouthpieces.

Mr. REMER asked the Postmaster-General if his attention had been called to the danger, according to medical opinion, of disease caused by germs lodged in telephone mouthpieces; and if his officers were considering any device to overcome this danger.—Mr. VIANT (Assistant Postmaster-General) replied: The view of the Post Office—based on competent medical opinion—is that the danger of infection from the use of telephones is negligible, although it is recognised that comfort and the general amenities demand that telephones should be kept reasonably clean. This is usually effected by subscribers themselves. So far as public call offices are concerned, it is the practice to disinfect the mouthpieces and earpieces at regular intervals, the frequency depending on the use made of the call office.

TUESDAY, MARCH 18TH.

Insanitary Conditions in Post Office Store.

Mr. WILLIAM BROWN asked the Postmaster-General whether he was aware of the outbreak of boils and carbuncles among the staff of the mechanical transport section of the Post Office stores housed in the old workhouse in Endell-street; whether he was aware that the accommodation in this building was infested with mice, which were themselves affected with skin diseases; whether he was aware that in the same building there was a bacteriological laboratory; and whether he would either remove his staff from the building or take steps to remove the vermin and the bacteria.—Mr. LEES-SMITH replied: This matter has been engaging my attention. It is the case that some members of the staff referred to have suffered from boils and carbuncles, A medical inspection has been made, and I am advised that there is no connexion between this outbreak and the proximity of a bacteriological laboratory or the presence of mice in the building. In view of the possibility that infection may have been spread by contact, disinfectant is now being used; and I am taking up the question of improving the sanitary arrangements. Urgent measures are being taken to exterminate the mice.

HOSPITAL COSTS.—Last year at Addenbrooke's Hospital, Cambridge, the average cost per week of each in-patient (3836) was £2 15*s.* 9½*d.*, an increase of 3*s.* 4½*d.* The average cost of each out-patient (12,104) was 6*s.* 9¾*d.*, an increase of 4¼*d.* At the Hampshire County Hospital, Winchester, the daily cost of each out-patient was 8*s.* 10*d.*, an increase of 5*d.* The cost of each out-patient, which had been estimated at 5*s.*, is now found by accountants to be 7*s.* 3*d.*—At the Bucks County Mental Hospital, Stone, the rate for the maintenance of patients from contributing unions was 19*s.* 10*d.* per head per week in the first half of last year and 19*s.* 3*d.* in the second half.—The cost per bed per week at Skegness Cottage Hospital (208 in-patients) was £1 19*s.* 0½*d.*—The weekly cost of an in-patient at Lymington Cottage Hospital (486 patients) was £2 3*s.* 2*d.*; at Horsham Cottage Hospital (482 patients) it was £3 8*s.* 10*d.*—At the Minehead and West Somerset Hospital last year the average weekly cost of each in-patient (812) was £2 18*s.* 10*d.* At the Pembroke County War Memorial Hospital the cost (645) was £2 8*s.* 5*d.* The cost of an in-patient at the Staffordshire General Infirmary, Stafford (1540 patients, average stay 15½ days), was £6 5*s.* 6*d.*, "less an estimated amount for out-patients." The Melton and District (Lincs) War Memorial Hospital spent £6 5*s.* per in-patient (599), a reduction of 18*s.* 1*d.*, X ray expenditure excluded. At Stroud General Hospital 789 in-patients cost £2 16*s.* 2*d.* per head per week.

Medical News.

UNIVERSITY OF CAMBRIDGE.—On March 14th the following degrees were conferred:—

M.B. and B.Chir.—R. M. Windeyer* and T. N. Parish.

* By proxy.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A meeting of the Council was held on March 17th, with Lord Moynihan, the President, in the chair.

Licences in Dental Surgery were granted to the following candidates, who were successful in the recent examination:—

C. G. Baker, John Barnes, David Bengis, V. S. A. Biggs, John Carter, Q. A. Davies, A. M. Garman, A. T. Gibb, A. J. D. Gibbings, D. D. C. Hamilton, William Headridge, H. R. Heald, H. R. Heathcote, J. A. C. Hunter, C. E. W. Kurtz, F. G. Lilley, W. O. Littler, A. C. R. McLeod, Mary S. MacWilliam, H. C. Norman, G. B. Palmer, J. P. Price, F. I. Robertson, J. D. Sellers, H. M. Selmann, G. B. Shaw, F. A. Sickelmore, J. A. Singer, K. P. Smith, M. L. Smith, J. L. Thornton, J. H. White, R. E. Wiles, *and* W. R. J. Wood.

Diplomas in Ophthalmic Medicine and Surgery were granted, jointly with the Royal College of Physicians, to 16 candidates.

Mr. C. H. Faggo was appointed the representative of the College to serve on a subcommittee of the People's League of Health to consider the subject of the Cause and Eradication of Bovine Tuberculosis.

Mr. Ernest W. Hey Groves was asked to represent the College at the annual meeting of the *Czecho-Slovakian* Orthopædic Society.

UNIVERSITY OF LONDON.—At a meeting of the Senate on Feb. 26th an interim grant of £75 was made out of the Thomas Smythe Hughes Medical Research Fund to Miss Kathleen Chevassut for continuation of the research on disseminated sclerosis which she described in THE LANCET of last week.

Applications are invited for grants from this and from the Beaverbrook Medical Research Fund, and from the Dixon Fund for assisting scientific investigation. Particulars are obtainable from the Academic Registrar.

Regulations for the Academic Diploma in clinical pathology have been approved and may be had from the Academic Registrar.

UNIVERSITY OF LIVERPOOL.—On June 5th the honorary degree of D.Sc. will be conferred on Mr. George Barger, F.R.S., professor of chemistry in relation to medicine in the University of Edinburgh.

UNIVERSITY OF EDINBURGH.—The honorary degree of LL.D. is to be conferred on Sir Thomas Barlow, F.R.S., consulting physician to University College Hospital; Sir Otto Beit, founder of the Beit memorial fellowships for medical research; Sir William Hardy, F.R.S., Director of Food Investigation in the Department of Scientific and Industrial Research; Sir David Wallace, consulting surgeon to the Edinburgh Royal Infirmary; and Prof. Karel Wenckebach, of Vienna.

CAMBRIDGE GRADUATES' MEDICAL CLUB.—The annual dinner of this club will be held at the May Fair Hotel, London, W., on March 27th at 7.30 for 7.45 P.M., with Dr. H. Morley Fletcher in the chair. The hon. secretaries are Mr. Reginald M. Vick, 113, Harley-street, W.1, and Dr. F. G. Chandler.

ROYAL NAVY MEDICAL CLUB.—The annual dinner will take place at the Trocadero Restaurant, Piccadilly-circus, London, on Thursday, April 24th, at 7.30 P.M. for 8 P.M. Members who wish to be present are asked to inform the hon. secretary of the Club, Queen Anne's Chambers, Tothill-street, S.W.1., *not later than seven clear days before* that date.

SOCIETY FOR THE STUDY OF INEBRIETY.—The annual meeting of this Society will be held at 11, Chandos-street, Cavendish-square, London, W., at 4 P.M., on Tuesday, April 8th. Dr. Percy C. Barham will open a discussion on the Difficulties of the Institutional Treatment of Alcoholism and Drug Addictions.

ENLARGEMENT OF RUGBY HOSPITAL.—It is proposed to spend between £20,000 and £25,000 upon additions and improvements to St. Cross Hospital, Rugby. A pavilion for treating tuberculous cases is to be substituted for the existing wooden hut, better accommodation is to be provided for nurses. and it is expected that £500 a year will be saved by a modern system of warming. The hospital's income last year exceeded £19,000; before the contributors' scheme was adopted it only slightly exceeded £12,000. Over £1000 was saved on the year's working.

Christie Hospital, Manchester.—An anonymous gift of £2000 has been received by the treasurer of the Christie Hospital (Cancer Pavilion and Home).

The "Hope Journal."—Under the description of "the official journal of the Hope Hospital," Pendleton, the first number of this magazine has just been issued.

International League for Campaign against Trachoma.—This league, which was founded at the Thirteenth International Ophthalmological Congress, will hold its next meeting at Geneva on July 28th. The president is Prof. Emile de Grósz, and the hon. secretary Dr. F. Wibaut, whose address is Budapest VIII., Mária-utca 39.

Course on Surgical Tuberculosis.—Under the direction of Dr. Etienne Sorrel, a course on the treatment of surgical tuberculosis will be held at the Hôpital Maritime de Berck-sur-Mer, Pas-de-Calais, France, from April 14th to 19th. Particulars may be had from Dr. Delahaye at the hospital.

Extension of West Middlesex Hospital.—Sir John Ferguson, M.P., has laid the foundation-stone of a new maternity block in the grounds of this poor-law institution. The building will include five wards of four beds each, one of five beds, and six single bed wards, and accommodation for midwifery pupils.

York County Hospital.—The Military Tattoo of the Northern Command last year produced £1400 for this hospital. So many main roads converge upon York that the hospital receives a considerable number of road accidents cases. Last year it treated 141 such cases at a cost of £1260, towards which £413 was received.

The King at the London Hospital.—On Tuesday last week the King and Queen paid a private visit to this hospital so as to see it at work in normal conditions. Their Majesties visited five wards, including a children's ward, and inspected two new covered ways provided by Sir William Paulin and his daughter to avoid the necessity of the nurses crossing the garden or passing through the wards on their way to the nurses' home. In the radium laboratory they watched the making of radon.

Instruction on Birth Control.—A conference on the giving of information on birth control by public health authorities will be held at the Central Hall, Westminster, on Friday, April 4th. It is stated that 60 local authorities have asked the Ministry of Health to allow them to provide facilities for giving such information. The conference is being organised by a group of societies and tickets may be had from the secretary, 9, Parliament Mansions, London, S.W. 1. Among the speakers will be Mr. Harold Chapple, senior obstetric surgeon to Guy's Hospital, and Dr. Maitland Radford, medical officer of health for Shoreditch.

Oxford Ophthalmological Congress.—This Congress will meet at Keble College, Oxford, on Wednesday, July 9th, and will go on till the 12th. Dr. H. M. Traquair, Sir Farquhar Buzzard, and Prof. J. A. Gunn will open a discussion on Toxic Amblyopia; Sir Oliver Lodge, F.R.S., will give an address on Modern Theories on the Nature of Light; Prof. Artur Schüller, of Vienna, will speak on Recent Developments in Radiology associated with Ophthalmology, and Prof. Jules Gonin, of Lausanne, on Detachment of the Retina and its Treatment; and the Doyne Memorial Lecture will be given by Dr. Harry Friedenwald, of Baltimore, on Pathological Changes in the Retinal Blood-vessels and their Significance. The hon. secretary of the Congress is Mr. C. G. Russ Wood, 12, St. John's-hill, Shrewsbury.

Scholarships and Grants for Scientific Research.—The Council of the British Medical Association is prepared to receive applications for an Ernest Hart Memorial Scholarship, of £200, and three research scholarships, each of £150 per annum. These are given to candidates whom the Science Committee of the Association recommends for research in any subject (including State Medicine) relating to the causation, prevention, or treatment of disease. Each is tenable for one year from Oct. 1st, and reappointment is possible for not more than two additional terms. Scholars may hold junior appointments at a University, medical school, or hospital, provided the duties of these appointments do not interfere with their work as scholars. The Council also invites applications for Grants for the assistance of research into the causation, treatment, or prevention of disease. Preference will be given, other things being equal, to members of the medical profession and to applicants who propose to study problems directly related to practical medicine. Applications for Scholarships and Grants must be made not later than May 21th, on a form obtainable from the Medical Secretary of the Association, B.M.A. House, Tavistock-square, London, W.C.1.

Plymouth Hospitals.—The amalgamation has been proposed of the South Devon and East Cornwall, the Central, and the Royal Albert Hospitals. The last-named is at Devonport.

Manchester Northern Hospital. — At the seventy-fourth annual meeting it was reported that £81,020 had been received towards the £150,000 needed for the new hospital, for which the new site is being prepared. The new hospital will be a general one, and not one confined to women and children.

St. Andrew's Hospital, Dollis Hill.—Last November the number of beds was increased from 52 to 74, and new wards and a nurses' home are now being erected at a cost of £30,000. The hospital, which last year received 1218 in-patients, is under the care of Sisters of Mercy, and is intended chiefly for members of the professional and middle-classes of any nationality and creed.

National Gardens Scheme.—The movement for throwing open famous gardens for the benefit of the Institute for District Nursing and other nursing institutions has again been conspicuously successful. Last year it produced £7705, an increase of nearly £1,000 upon the amount obtained in 1928.

Three Generations of Hospital Service.—Dr. F. R. Mallett, President of the Bolton Infirmary, has been entertained at a complimentary dinner by the committee and honorary medical staff of the institution, in recognition of the services of his family and himself. Dr. Mallett's grandfather became connected with the hospital 113 years ago, and his own service extends over 35 years.

Camden-road Sunlight Clinic.—Sir William Hale-White, president of the medical advisory committee of the new Institute of Ray Therapy at 152–154, Camden-road, described the objects of the clinic at the opening ceremony on March 13th. The clinic has its origin[1] in the generous gift of Mr. G. F. Kimber, who subscribed £10,000 for building and equipment. Patients must bring a certificate from their family doctors, on which an estimate of their financial standing will be noted; they will be charged, according to their means, sums ranging from 1*s.* to 5*s.* for a treatment, and in necessitous cases treatment will be free. As the Institute is primarily for the benefit of poor persons, patients with private means will not be accepted. The three objects of the Institute are treatment, training, and research; cases were under treatment, even before completion of building operations, and over 200 patients have been treated since Jan. 9th. The London County Council school service and care committees are arranging for the treatment of groups of children, and a central room offers accommodation for group treatment on a large scale. In all, there are 18 lamps of the most recent pattern, and an X ray apparatus in addition; the upper floor of the building is divided into cubicles for special forms of treatment; two of these are devoted to the treatment of rheumatism, one to skin diseases, one to conditions of the nose and throat, one to tuberculosis, one to asthma, one to eye diseases, and two to gynæcological conditions. Much of the arduous work of preparation has been performed by Dr. William Beaumont and his wife, who have shown untiring energy since the inception of the scheme.—The Lord Mayor, Sir William Waterlow, said he understood that one of the purposes of the clinic was to stabilise the uses of ray therapy and to estimate its capacity for good. This would be the concern of the medical staff and the voluntary advisory committee. For his part he liked to think of clinics of this type as the poor man's Riviera. The work would not only include treatment and cure of the sick but reinvigoration of those deprived of sufficient sunlight—that prevention of disease which was better than cure. He declared the clinic open.—Mr. Kimber, in proposing a vote of thanks to the Lord Mayor, said the clinic had been born of a remark made by the hon. medical director two years before; speaking of ray therapy he had said: "If only we had the money there's no telling what we could do." The clinic owed much to the generous help of many friends, in service, goods, and money; the Hearts of Oak Benefit Society had made a grant towards the upkeep of the first 18 months.—A tour of the building was then made by the guests, and patients were observed receiving treatment in the cubicles. The water-cooled tungsten lamp for the treatment of asthma serves a double purpose, since its fumes are in themselves regarded as beneficial to the condition. The lamp for the treatment of eye diseases can be focused so that only a small portion of the lid or cornea need be under treatment at a time without danger to the rest of the eye. Other new designs of apparatus were demonstrated, including an infra-red lamp.

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[1] See THE LANCET, Feb. 15th, p. 367.

NORTH ORMESBY HOSPITAL.—It is proposed to enlarge this Middlesbrough hospital at a cost of £30,000. It has already been twice extended since the war. It is claimed to have been the first English cottage hospital, but it was not founded until 1857. Warwick College hospital goes back to 1823, that at Frodingham, Lincolnshire, to 1844, and that at Ripon to 1850.

INFECTIOUS DISEASES HOSPITALS IN THE WEST RIDING.—Basing their views upon a report from the county medical officer, the public health committee of the West Riding county council recommend that the urban and rural districts should be grouped into a number of hospital areas, with ten groups for general infectious diseases and seven for small-pox. It is estimated that the cost will be £330,000. It is further recommended that the county council should contribute towards the cost of erecting new and enlarging existing hospitals.

BRISTOL GENERAL HOSPITAL.—Although there was last year an increase of income under nearly every heading, the excess of ordinary expenditure over ordinary income was £10,544. The adverse balance in 1928 was £12,197, and in 1927 £13,465, a total of more than £36,000 in three years. Most of the legacies received last year had to be used to meet the deficit. New male and children's wards and a new operating theatre are about to be built at a cost of £17,000.

ROYAL WESTMINSTER OPHTHALMIC HOSPITAL.—At the annual meeting last week it was stated that during the past year more beds had been opened and new departments installed. The increase of work in a building more than double the size of the old hospital increased the expenses by £13,000, which has, however, been more than met. The Guild of Gratitude has been "heartily received" by the patients, and now has more than 15,000 members, who have collected over £3000 in pence and shillings.

PUBLIC ASSISTANCE ARRANGEMENTS IN KENT.—Dr. Alfred Greenwood, the county medical officer, and Mr. John Moss, the county public assistance officer for Kent, have made a survey of the poor-law institutions in the county, and have prepared a joint report suggesting some measure of classification now or later. They observe that if a few institutions are developed on hospital lines there should be available in many parts of the county a specialised institution which should provide the skilled treatment required. To assist classification it might be found possible to appropriate suitable poor-law institutions, or portions of them, for the accommodation of groups of mental defectives who have hitherto been scattered about the county. Where in a particular area there are two or three institutions it should be possible to develop one of them on hospital lines. Classification by institution, it is pointed out, involves the necessity of an effective ambulance service, so that the sick can be transported rapidly to the place where especially skilled nursing is available.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, March 24th.—8 P.M., ODONTOLOGY. Paper: Sir William Willcox: Dental Sepsis—a Retrospect. Casual Communication: Mr. F. Coleman: Buried Mandibular Teeth with Crowns in Occlusion.

TUESDAY.—5 P.M., MEDICINE. Discussion on Syphilitic Aortitis. Opener: Prof. Erich Leschke (Berlin). Followed by Dr. J. Parkinson, Dr. J. Cowan, and Dr. T. F. Cotton. Other speakers will also take part.

WEDNESDAY.—5 P.M., COMPARATIVE MEDICINE. Papers: Dr. P. J. Cammidge: The Hereditary Transmission of Hypoglycæmia in Mice. Mr. S. R. Douglas: The Preparation of Tuberculin. Mr. F. C. Minett: The Clinical Forms and Bacteriology of Bovine Mastitis. Dr. G. Scott Williamson: Prophylaxis against Goitre in Fish Hatcheries.

THURSDAY.—8.30 P.M., UROLOGY. Clinico-Pathological Evening.

FRIDAY.—DISEASE IN CHILDREN. Clinical Meeting at King's College Hospital, Denmark Hill, S.E. 4.15 P.M., Tea will be served. 4.30 P.M., Cases will be shown. 5 P.M., Discussion on Cases. 8 P.M., EPIDEMIOLOGY. Paper: Dr. William Fletcher: Typhus-like Diseases of Unknown Ætiology.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, March 24th.—8.30 P.M., Discussion on Coliform Infections of the Genito-Urinary Tract, to be introduced by Sir Thomas Horder and Mr. Kenneth Walker.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W.

FRIDAY, March 28th.—8.30 P.M., Papers will be read by Dr. D. Kathleen Brown and Dr. B. B. Sharp on Vulvo-vaginitis. A Discussion will follow.

HUNTERIAN SOCIETY.

MONDAY, March 24th.—7.30 P.M., the Third Dinner Meeting (at Simpson's Restaurant, 2 and 3, Bird-in-hand Court, 77, Poultry, Cheapside). 8.30 P.M., Discussion on Athletics in Schools, to be opened by Dr. L. R. Lempriere, Dr. A. I. Simey, Dr. Helen Boyle, Mr. H. M. Abrahams, Dr. Adolphe Abrahams, and Group-Captain Martin Flack, R.A.F.

ROYAL INSTITUTION, 21, Albemarle-street, W.

TUESDAY, March 25th.—5.15 P.M., Dr. Charles Singer: Inductive Philosophy and Some of Its Instruments.

THURSDAY.—5.15 P.M., Mr. J. B. S. Haldane: Some Problems of Genetics.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

TUESDAY, March 25th.—5 P.M., Dr. Carey F. Coombs: Syphilis of the Heart and Great Vessels. (Second Lumleian Lecture.)

THURSDAY.—5 P.M., Dr. Carey F. Coombs: (Last Lumleian Lecture).

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.

WEDNESDAY, March 26th.—4 P.M., Mr. Harold D. Gillies: Plastic Surgery. (Lantern lecture.)

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark Hill, S.E.

THURSDAY, March 27th.—9 P.M., Dr. Clayton: Fibrositis and Its Treatment.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, March 24th, to SATURDAY, March 29th.—MEDICAL SOCIETY Lecture Room, 11, Chandos-street, Cavendish-square, W. Tues., 4 P.M., Lecture by Mr. A. Tudor Edwards: Modern Surgical Developments in Chest Disease. No fee.—VICTORIA HOSPITAL FOR CHILDREN, Tite-street, S.W. Thurs. at 2 P.M., Demonstration by Mr. Max Page. No fee.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E.—Special Post-graduate Course in Medicine, Surgery, and Gynæcology. Operations and Lecture-demonstrations in the Wards and Out-patient Departments.—WEST END HOSPITAL FOR NERVOUS DISEASE, 73, Welbeck-street, W. Special post-graduate course of lectures and clinical demonstrations. Daily at 5 P.M.—LONDON LOCK HOSPITAL, 91, Dean-street, W. Post-graduate course in Venereal Disease. Clinical instruction daily in the afternoons and evenings.—Further particulars from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, March 24th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat, and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose, and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases. Clinics. Operations.

NATIONAL HOSPITAL POST-GRADUATE COURSE, Queen-square, W.C.

MONDAY, March 24th.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Adie: Forms of Muscular Atrophy.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Grainger Stewart: Acute and Subacute Myelitis.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Riddoch: Neuralgia in the Distribution of the Cranial Nerves.

FRIDAY.—12 noon, Dr. Purdon Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Symonds: Disseminated Sclerosis.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.

TUESDAY, March 25th.—5 P.M., Dr. J. A. Willett: The Importance of Antenatal Care.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL.

FRIDAY, March 28th.—4 P.M., Mr. Harold Kisch: Nasal Obstruction.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.

WEDNESDAY, March 26th (at St. John's Hospital, 49, Leicester-square, W.C.)—4.15 P.M., Clinical Cases. 5 P.M., Dr. J. O'Donovan: The Significance of Pattern Reaction in Dermatology.

ROYAL DENTAL HOSPITAL OF LONDON, Leicester-square, W.C.

WEDNESDAY, March 26th.—6 P.M., Mr. J. G. Turner: Extraction.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, March 25th.—5 P.M., Dr. H. MacCormac: Malignant Growths of the Skin.

THURSDAY.—5 P.M., Dr. W. N. Goldsmith: Benign Growths of the Skin.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

Tuesday, March 25th.—4.15 P.M., Mr. A. H. Burgess: Spinocain Spinal Anæsthesia.

Friday.—4.15 P.M., Mr. H. H. Rayner: Demonstration of Surgical Cases.

ANCOATS HOSPITAL POST-GRADUATE COURSE, Mill-street, Manchester.

Thursday, March 27th.—4.15 P.M., Dr. N. Kletz: Affections of the Kidneys with Special Reference to Nephritis.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

Friday, March 28th.—3.30 P.M. (at the Royal Infirmary), Mr. J. H. Cobb: Nasal Sinusitis.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

Wednesday, March 26th.—4.15 P.M. (Royal Infirmary), Dr. J. F. Smith: Skin Cases.

Appointments.

Badenoch, A., M.B., Ch.B.Edin., has been appointed Certifying Surgeon under the Factory and Workshop Acts for East Linton (East Lothian).

Franks, C., M.D. Brux., L.S.A., D.P.H., Medical Officer of Health, Durham County, and **McIntyre, J.**, M.D., Ch.B. Edin., D.P.H., Deputy Medical Officer of Health.

Kiep, W. H., M.B., Ch.B. Glasg., to be a Specialist Medical Referee under the Workmen's Compensation Act, to take Ophthalmic cases arising in the Districts of the Bradford, Keighley, Skipton and Settle, Halifax and Huddersfield County Courts.

McKeggie, J. W., M.B., Ch.B. Aberd., D.P.H., Medical Officer of Health, West Hartlepool.

M'Polin, M.D., N.U.I., D.P.H., Medical Officer for Limerick County.

Sewell, D. Lindley, M.B., B.S. Lond., M.R.C.S., Honorary Surgeon-Laryngologist to the Manchester Radium Institute.

Vacancies.

For further information refer to the advertisement columns.

Barnsley, Beckett Hospital and Dispensary.—Jun. H.S. At rate of £140.

Barrow-in-Furness, North Lonsdale Hospital.—H.S. £175.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.S. Also Asst. H.P. Each at rate of £100.

Bengal, Burdwar District, Asansol Mining Settlement.—Chief Sanitary Officer. Rs.1000 monthly.

Blackburn and East Lancashire Royal Infirmary.—4th H.S. £130.

Bolton Infirmary and Dispensary.—H.S. At rate of £150.

Bootle Borough Hospital, Derby-road.—Jun. H.S. At rate of £150.

Cardiff Royal Infirmary.—H.S. to Ophthalmic Dept. At rate of £75.

Charing Cross Hospital, W.C.—Asst. Physician.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.

Colonial Medical Services.—Medical Officers.

Connaught Hospital, Orford-road, E.—Sen. Res. H.S. At rate of £150. Also Jun. Res. H.S. At rate of £100.

Dartford, Kent, Darenth Training Colony.—Med. Supt. £1000.

Denbigh, North Wales Sanatorium, Llangwyfan.—Third Asst. Res. M.O. £250.

Derby, Bretby Hall Orthopædic Hospital, nr. Burton-on-Trent.—Asst. M.O. At rate of £150.

Dudley, Guest Hospital and Eye Infirmary.—Asst. H.S. £150.

Durham County Council.—Venereal Diseases M.O. £750.

East London Hospital for Women and Children, Shadwell, E.—Cas. O. At rate of £125.

Edinburgh Hospital for Crippled Children.—Surgeon. £1000.

Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £150.

Folkestone, Royal Victoria Hospital.—Sen. and Jun. Res. M.O.'s. At rate of £125 and £100 respectively.

Freemasons Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Radiologist.

Hackney Hospital, High-street, Homerton, E.—Asst. M.O. £350.

Hertford County Hospital.—Res. Surg. O. At rate of £250.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. Also H.P. At rate of £150 and £100 respectively.

Hospital for Sick Children, Great Ormond-street, W.C.—Res. M.O. for County Branch Hospital, Tadworth, Surrey. At rate of £250.

Hull Royal Infirmary.—H.S. Cas. H.S. At rate of £150 and £130 respectively. Hon. Surgeon. Also Hon. Asst. Surgeon.

Inverness, Northern Infirmary.—H.P. and Jun. H.S. £100.

Ipswich, East Suffolk and Ipswich Hospital.—Two H.S.'s. Each £120.

Jerusalem, St. John Ophthalmic Hospital.—Registrar.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

Liverpool, David Lewis Northern Hospital.—Res. M.O. £100.

London Homœopathic Hospital, Great Ormond-street, and Queen-square, W.C.—Res. M.O. £100.

London Hospital, E.—Asst. Radiologist.

London Lock Hospital, 91, Dean-street, W.—1st and 2nd H.S.'s. Each at rate of £200. Also Surg. Reg. £100.

London Lock Hospital, 283, Harrow-road, W.—Surg. Reg. £100.

London Temperance Hospital, Hampstead-road, N.—Res. M.O. Also H.P. At rate of £175 and £100 respectively.

Macclesfield General Infirmary.—Second H.S. At rate of £150.

Manchester, Ancoats Hospital.—Res. Surg. O. £200.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Manchester Royal Infirmary.—Hon. Asst. Surgeon.

Manchester, Victoria Memorial Jewish Hospital, Cheetham.—Hon. Radiologist.

Metropolitan Hospital, Kingsland-road, E.—Physician to Dept. for Diseases of Skin.

Middleton-in-Wharfedale Sanatorium, nr. Ilkley.—Jun. Res. M.O. £250.

Newcastle-upon-Tyne, City Mental Hospital, Gosforth.—2nd Asst. M.O. £400.

Northern Rhodesia, Roan Antelope Copper Mines, Ltd.—2nd M.O. £900–£1000.

Norwich, Norfolk and Norwich Hospital.—H.S. to Special Depts. Also Cas.O. and H.S. Each £120.

Nottingham General Hospital.—2nd Cas. O. At rate of £150.

Oswestry, Shropshire Orthopædic Hospital, &c.—Two H.S.'s. Each at rate of £200.

Paddington Green Children's Hospital, London, W.—H.P. and H.S. Each at rate of £150

Prince of Wales's General Hospital, Tottenham, N.—Hon. Phys. Also Sen. H.P., Sen. H.S., and Special H.S. Each at rate of £120. Also Jun. H.P., and Two Jun. H.S.'s. Each at rate of £90.

Rampton State Institution for Mental Defectives, near Retford, Notts.—4th M.O. £547 10s.

Reading, Royal Berkshire Hospital, Langley Hill, Calcot.—H.S. At rate of £160.

Royal Chest Hospital, City-road, E.C.—Res. M.O. Also H.P. At rate of £150 and £100 respectively.

Royal Northern Hospital, Holloway-road, N.—Pathologist. £750. Also Asst. Pathologist. £500.

St. Andrew's Hospital, Dollis Hill, N.W.—Sen. and Jun. R.M.O.'s.

St. Mary's Hospital, W.—Obstetric Regstrar. £50.

St. Mary's Hospital for Women and Children, Plaistow, E.—Asst. Res. M.O. At rate of £120. Also Clin. Asst. for Medical Out-patients Dept.

Salford Royal Hospital.—H.S. At rate of £125.

Shanghai Municipal Council, P.H. Dept.—Asst. Pathologist. 650 Taels per mensem.

Sheffield, Children's Hospital, Western Bank.—3rd Res. M.O. £100.

Sheffield Royal Hospital.—Ophth. H.S. Also Res. Anæsthetist. Each at rate of £80.

Sheffield Royal Infirmary.—Ophthalmic H.S. At rate of £80.

Southampton, Royal South Hants and Southampton Hospital.—Cas. O. At rate of £130 to £160.

Stockport County Borough, Stepping Hill Hospital.—Res. Asst. Med. Supt. &c. £350.

Stockport Infirmary.—Res. Surg. O. £250.

Surrey County Council.—Asst. M.O. £600.

Tiverton Hospital, Devonshire.—H.S. At rate of £100.

Watford, Herts, Peace Memorial Hospital.—2nd Res. M.O. At rate of £150.

West Bromwich and District General Hospital.—Cas. H.S. At rate of £200.

Westminster Hospital, Broad Sanctuary, S.W.—Hon. Asst. Administrator of Anæsthetics.

Woolwich and District War Memorial Hospital, Shooters-hill.—H.P. and H.S. Each at rate of £125.

Willesden General Hospital, N.W.—Clin. Assts. to Surgical Out-patients' Dept.

Winchester, Royal Hampshire County Hospital.—Hon. Ophth. S.

Births, Marriages, and Deaths.

BIRTHS.

Alden.—On March 13th, at Woodstock-road, Oxford, the wife of Dr. J. W. Alden, of a son.

Balfour.—On March 15th, at Downholm, Ringmer, Sussex, the wife of Ivor H. C. Balfour, M.R.C.S., of a daughter.

Gibson.—On March 11th, at Amalfi, Torquay, the wife of Paul C. Gibson, M.D., of a daughter.

Molesworth.—On March 13th, at Cleveland House, Brixham, Devon, the wife of Dr. Eric M. Molesworth, of a son.

Potts.—On March 16th, at The Gables, Bracknell, the wife of Dr. C. Lawrence Potts, of a son.

Scott.—On March 14th, at Abbotsford, Capel-road, East Barnet, the wife of C. Mervyn Scott, M.R.C.S., L.R.C.P., of a daughter.

Solomons.—On March 16th, at Meadway, Hampstead Garden Suburb, N.W., the wife of Dr. Barnet Solomons, of a son.

MARRIAGES.

Ainsworth—McKinley.—On March 4th, at West Kirby Presbyterian Church, Richard Murray Ainsworth, M.B., M.R.C.S., to Sarah Margaret, second daughter of Mrs. A. B. McKinley, of West Kirby, Cheshire.

DEATHS.

Armit.—On March 12th, in Sydney, Henry William Armit, M.R.C.S., L.R.C.P., Editor of the *Medical Journal of Australia*, younger son of the late William Armit, formerly Secretary to the Hudson's Bay Company, aged 59.

Fagan.—On Saturday, March 15th, at Highgate, Arthur Roberts St. Leger Fagan, M.R.C.S., L.R.C.P., in his 68th year.

Levick.—On March 8th, George Kenny Levick, M.B., B.S., of Havant, Hants, in his 62nd year.

Paton.—On March 11th, at Leighton Buzzard, Frederick Erskine Paton, M.B., of St Margaret's, Banbury-road, Oxford.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE TEACHING OF PARENTCRAFT.

At the annual meeting of the National Baby Week Council on March 12th Dr. H. K. Waller opened a discussion on the question: "How can a knowledge of parentcraft be extended to parents whom the existing welfare services do not reach?" He suggested the foundation of more clinics for subscribers, on the plan of the Babies' Club at Chelsea; the parents who attended the club were usually in a position to pay a subscription of £5 5s. yearly. An absence of poverty did not necessarily mean knowledge of mothercraft, and many of these women were interested in modern methods and anxious to learn. There was no reason to suppose that such clinics would interfere with the work of the family doctor, but it must be guaranteed by every clinic that only preventive measures would be discussed; mothers must be advised to take sick children to the family doctor. At the same meeting Mrs. Eva Hubback described a clinic of the kind which is to be opened at Hampstead Garden Suburb, and Dr. Margaret Emslie spoke of another where subscriptions were lower than those advocated by Dr. Waller, but which was not self-supporting. Mr. E. B. Turner reminded the Council that the representative meeting of the British Medical Association had expressed disapproval of these clinics. The family doctor with his knowledge of the parents and the home was, he said, the proper person to instil the principles of mothercraft. The subscription to the clinic would be better spent in summoning him for an equal number of attendances. Dr. D. H. Geffen replied that the general practitioner was not suited to carry on the work of the clinics, which included infant psychology, preparation of food, and knitting. The great object of such a clinic was to secure cases of illness early and to send them to the family doctor. In any event, nothing should be considered before the welfare of the mother and child, not even the position of the medical practitioner. Mr. Turner rejoined that a sufficient medical service would abolish the need for clinics entirely.

TONICO RAZOR PASTE.

Dr. F. W. Cory has called our attention to a preparation designed to give a keen edge to such articles as microtomes, lancets, and razors. It is described as non-abrasive and antiseptic and consists of two pastes, one to be used on the rough side of the strop for sharpening and the other on the smooth side for finishing. Dr. Cory speaks of a "tonic action" by which the "tired" metal is revived so that the instrument can be used every day without resting. The preparation which is marketed by Messrs. Osborne and Garrett, Frith-street, London, can be obtained from chemists and barbers.

HERO WORSHIP IN SURGERY.

To the Editor of THE LANCET.

SIR,—In the course of the Hunterian Oration (THE LANCET, Feb. 22nd, p. 390) Prof. Hey Groves makes the following statement. "We have also to deplore the loss of the last known descendant of the Hunter family in the person of Miss Helen Hunter Baillie, the great-grand-niece of John Hunter, who died in Feb., 1929, at the age of 86."

May I point out that this is incorrect. This great lady was the last of her generation—the third generation—but the children of her two married sisters are still alive and are great-great-grand-nieces of John Hunter. These are the children of Mrs. Oliver of whom four are alive, and the three daughters of Mrs. Maconechy. These are the fourth generation. The four children of Miss Muriel Maconechy—my wife—are the sole representatives of the fifth generation. The accompanying tree makes this descent more clear than it can be expressed in writing.

I am, Sir, yours faithfully,

Guildford, March 1st, 1930. T. B. JOBSON.

APPLES FOR DYSENTERY.

To the Editor of THE LANCET.

SIR,—Your article in THE LANCET of March 8th, pointing out how old popular remedies turn up again, and especially the revival of the use of apples in dysentery and typhoid, has a peculiar interest for me. When assisting at the epidemic of typhoid which occurred at Worthing towards the end of last century, I was called to see a patient—a strict vegetarian—who declined to be dieted in the ordinary way, but insisted on having large numbers of roasted apples. I anxiously awaited the outcome. The patient did so well that I began to adopt a similar diet in other cases with the most gratifying results. On my return to London I read a paper about the epidemic before the St. George's Hospital Hunterian Society, in which I pointed out that cases dieted in this way were very seldom constipated, and consequently that laxatives and enemata were hardly ever required; also that the patients were much less emaciated.

A few days after reading my paper my attention was drawn by Dr. Cyril Ogle to an article of Sir William Jenner's in which he had pointed out that the pulp of apple was an excellent thing for typhoid patients; in fact, that my treatment was an old remedy turning up again. May I add that I used to order the apples to be pulped and passed through a colander; that cream, whipped cream, or white of egg are useful adjuncts and a pleasant variety for the patient.

I am, Sir, yours faithfully,

JOHN W. DICKSON.

Sloan-terrace Mansions, S.W., March 11th, 1930.

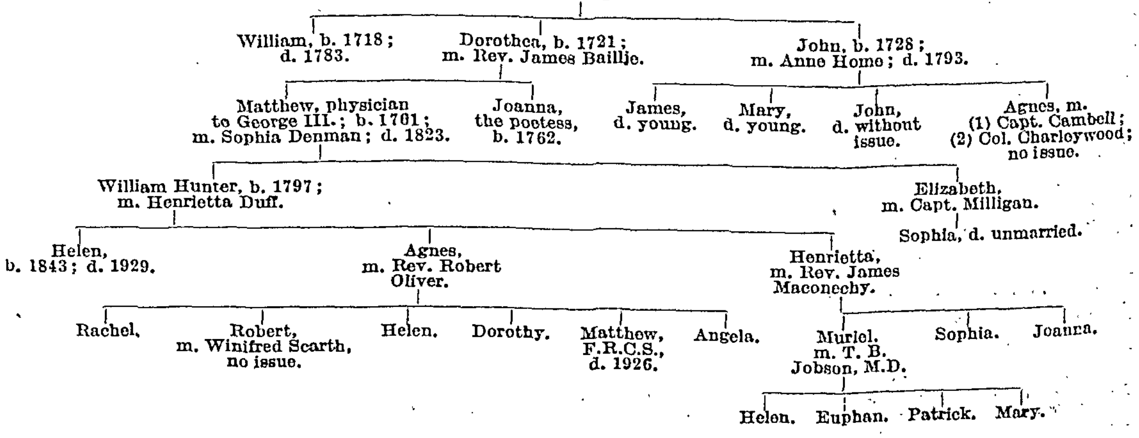
NEW PREPARATIONS.

DIGINUTIN.—Messrs. Burroughs Wellcome and Co. are also placing a stable preparation of digitalis on the market, a solution of the total glucosides of digitalis leaf free from inert extractive matters. Specimens biologically tested after storage for more than a year retain their activity, a quality which in many circumstances is distinctly valuable and one which clinical reports confirm. Other advantages claimed for the preparation are that the physiological standardisation of the solution is particularly accurate owing to the absence of inert vegetable matter, while the fact of it being in solution aids in the rapid response to the drug.

BROSEDAN (Coates and Cooper, 41, Gt. Tower-street, London, E.C.).—This is a German preparation described as a yeast preparation containing sodium bromide. Its administration is quite simple, one to three teaspoonfuls being given in half a breakfast cup of hot water at bed time. The drug has been found to have sedative qualities in neurasthenia and many nervous manifestations, and specially in the course of the treatment of epilepsy. In this connexion it has received favourable notice from clinical workers and medical journals in Germany.

Corrigendum.—In the annotation last week on Pulmonary Tubercle of Bovine Type (p. 584) line 14 should read: "in culture and its *high* virulence . . ."

PEDIGREE OF
John Hunter of Long Calderwood.


William, b. 1718; d. 1783.
Dorothea, b. 1721; m. Rev. James Baillie.
John, b. 1728; m. Anne Home; d. 1793.
Matthew, physician to George III.; b. 1761; m. Sophia Denman; d. 1823.
Joanna, the poetess, b. 1762.
James, d. young.
Mary, d. young.
John, d. without issue.
Agnes, m. (1) Capt. Cambell; (2) Col. Charleywood; no issue.
William Hunter, b. 1797; m. Henrietta Duff.
Elizabeth, m. Capt. Milligan.
Sophia, d. unmarried.
Helen, b. 1843; d. 1929.
Agnes, m. Rev. Robert Oliver.
Henrietta, m. Rev. James Maconechy.
Rachel.
Robert, m. Winifred Scarth, no issue.
Helen.
Dorothy.
Matthew, F.R.C.S., d. 1926.
Angela.
Muriel. m. T. B. Jobson, M.D.
Sophia.
Joanna.
Helen.
Euphan.
Patrick.
Mary.

Arris and Gale Lecture

ON THE RÔLE OF

SHORT CIRCUIT OPERATIONS IN THE TREATMENT OF CHOLECYSTITIS.

Delivered before the Royal College of Surgeons of England on Feb. 17th, 1930,

BY R. H. O. B. ROBINSON, M.B. CAMB.,
FELLOW OF THE COLLEGE; SURGEON TO OUT-PATIENTS, ST. THOMAS'S HOSPITAL; ASSISTANT SURGEON TO THE CITY OF LONDON HOSPITAL FOR DISEASES OF THE HEART AND LUNGS.

ALTHOUGH notable advances have been made in the surgical treatment of inflammatory conditions affecting the bile passages and in our knowledge of the pathological changes at work, it must be admitted that there is still room for improvement, and this fact leads us to consider in what manner the results of our treatment are unsatisfactory and how this failure may possibly be remedied.

Before turning definitely to the subject of treatment there are certain points in connexion with the anatomy and physiology of the gall-bladder which should be borne in mind as well as some established facts concerning the pathology of inflammation in the biliary tract.

ANATOMY AND PHYSIOLOGY OF GALL-BLADDER.

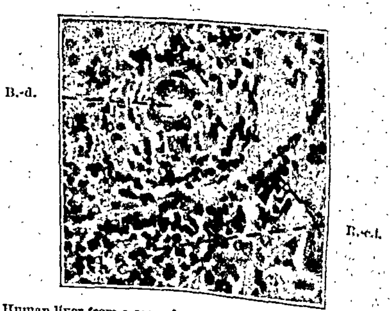
The gall-bladder, in common with the rest of the biliary apparatus, is developed as a diverticulum from the duodenum and possesses certain points of resemblance to it in structure and in function. The under surface of the body of the gall-bladder is in contact with the upper part of the duodenum and adjacent to the pyloric portion of the stomach. The neck and cystic duct pursue an S-shaped course toward the portal fissure, and the mucous membrane within this portion is thrown into from 5 to 12 concentric folds, the spiral valve of Heister. Mentzer,[1] of the Mayo Foundation, in an extensive study of its mechanism, could find no evidence of valvular action—that is to say, bile could pass with equal freedom in either direction—and Keith has pointed out that it is the very reverse of a valve, being an ingenious device to prevent any obstruction to inflow or egress consequent on kinking at the neck. The mucous membrane in the interior of the gall-bladder proper is thrown into numerous folds covered by a single layer of columnar epithelium and, as Boyd[2] has shown, these folds are so arranged that, on section, they appear as villi and may be spoken of as such, although strictly speaking not so, and further that this structure is suggestive of absorption. This absorptive power appears to be selective for water, salts, lipoids, and probably cholesterol.

Halpert,[3] working at the Johns Hopkins Hospital, has drawn attention to the fact that the muscle and elastic tissue of the organ resemble the muscularis mucosæ of the gut and suggests that they have a similar function—namely, to throw the mucosa into folds—and Boyden,[4] of Chicago, has drawn attention to the remarkable apparent increase in thickness of its wall consequent upon collapse of the organ by contrast with the condition it presents when distended. This point I shall refer to again later. Lastly, Kodama,[5] working with Graham, in a study of the lymphatic drainage of the gall-bladder, has shown that there is free communication between its lymphatics and those of the adjacent liver, the bile-ducts, the upper end of the duodenum, and the surface of the pancreas. The various activities of the intact gall-bladder are associated closely with the sphincter of the common bile-duct or sphincter of Oddi. It has been stated that in animals in which the gall-bladder is lacking, the sphincter is inadequate, and Judd and Mann[6] have suggested that this is so in the human subject after cholecystectomy, owing to increased pressure in the common bile-duct.

PATHOLOGY.

In considering the pathological changes of inflammation in the biliary tract it is convenient to include cholelithiasis with cholecystitis, for in cholecystitis calculus formation appears to be inevitable sooner or later, and in the vast majority of cases of cholelithiasis there is definite evidence of infection even if we allow that it is possible for a solitary stone to form in the absence of infection, although D. P. D. Wilkie[7] has recently produced evidence against such a process.

FIG. 1.



Human liver from a case of gall-stones showing a portal sheath with marked round-celled infiltration. B.-d. = bile-duct R.-c.i. = round-celled infiltration.

The pathological gall-bladder presents us with several problems which must be overcome if treatment is to achieve the best results. Firstly, it presents itself as a focus of infection, secondly as a factory of calculi, and thirdly as a potential site of carcinoma. To take these points in more detail, the gall-bladder may present itself to us during an attack of acute inflammation—in which event it forms one variety of acute intraperitoneal catastrophe—or as the site of chronic infection it may affect other parts of the biliary tract or provide a focus of generalised infection. It is well established that the gall-bladder when acutely inflamed compares very favourably with other intraperitoneal viscera—that is to say, peritonitis of any severity is rare—and that after an attack of acute inflammation under favourable circumstances the organ can return to almost its normal condition. The presence of fibrosis in the wall of the bladder need not necessarily interfere with its function any more than the scar of a whitlow need interfere with the function of a digit, or prove any greater argument for its removal. Unfortunately, however, in the case of such a cul-de-sac as the gall-bladder there is a tendency for the resultant fibrous tissue or associated calculi to interfere with function, producing stagnation and persistent infection. This infection is particularly marked in the outer coats, probably owing to the antiseptic properties of the bile in contact with the gall-bladder mucosa, as Rosenow[8] and A. L. Wilkie[9] have shown. The effects of this infection are by no means limited to the gall-bladder, as might indeed be presupposed from a knowledge of its lymphatic drainage, and thus we find in many—and if we accept some authorities in all—cases of cholecystitis changes in other parts of the biliary tract. In the liver, especially that part adjacent to the gall-bladder, but also widespread in the hepatic portal sheaths as stressed by Graham[10] and by Judd[11] and evidenced macroscopically in many cases by scarring on the surface of the li in the bile-ducts as pointed out by Burden [12] and affecting the pancreas as shown by Deaver and Sweet [13] and by Graham.[14] One might point out in this connexion that little information is extant about the fate of these associated lesions following cholecystectomy. How common infective changes are outside the gall-bladder itself is shown by the fact that in 281 cases of cholelithiasis which I [15] investigated and in which stones were limited to the gall-bladder jaundice occurred at some stage in 36 per cent. Fig. 1 shows well-marked infective changes in the hepatic portal sheaths in a subject suffering from stones limited to the gall-bladder and treated by cholecystectomy.

The actual path of infection to the biliary tract has been the subject of much research and discussion, and it appears that the lymphatic route and the hæmatogenous, as pointed out by Moynihan[16] and D. P. D. Wilkie,[7] are the most usual. But Moynihan has called attention to the additional possibility of direct infection up the common duct in the presence of achlorhydria with consequent increase of intestinal flora.

When we come to consider the gall-bladder as a factory of calculi we find again that this point is bound up with the question of infection. It is probable that all calculi, even the solitary stone, are the product of inflammatory changes. However, if stasis is prevented and free drainage is provided, calculus formation should prove impossible owing to the prevention of cholesterol accumulation and the prompt removal of biliary grit even if formed. This is important, for such particles are capable of increase in size and the production of obstruction throughout the biliary tract.

The last fact in the pathology of the gall-bladder, to which I shall refer, is that it is a potential site of carcinoma; but this seems to be so definitely associated with the presence of antecedent inflammation and calculus formation that if chronic irritation is avoided it is unlikely to occur and in actual fact carcinoma of the gall-bladder is not as common as is usually supposed.

The treatment of cholecystitis, then, must consist in abolition of persistent infection within the biliary tract—though not necessarily in abolition of the aftermath of infection—and in the removal of calculi and the prevention of further calculus formation. By dealing with these two points the possibility of carcinoma will be avoided.

TREATMENT.

In the treatment of cholecystitis I think there is general agreement that it is only by surgical intervention, in all but the mildest cases, that we can hope to give material benefit, and surgical treatment has consisted, speaking generally, of draining or removing the gall-bladder.

Drainage of the gall-bladder, or cholecystostomy, was the first operation undertaken and for a time enjoyed an uninterrupted vogue. Let us consider how it deals with the problems I have discussed and in what ways it fails to do so.

The inevitable drawback to the operation is that it is a purely temporary measure. By draining an inflammatory focus the operation relieves congestion and stasis, makes possible the removal of calculi, and, if the cystic duct is still patent, drains for a time the biliary tract, having a beneficial effect on associated cholangitis and retention of biliary excretion. Once the fistula closes, however, it leaves, as a rule, a gall-bladder with the factors that caused the original symptoms still operative, so that in many cases symptoms of greater or less severity recur, produced by persistent infection, or by fresh calculi. If when drainage is carried out the cystic duct has been obliterated completely, a mucous fistula will almost certainly be the result, and this will not heal without further operation. However, it must be admitted that, provided the cystic duct is patent, during the period of drainage the effect of the operation is good. These points are brought out by the following statistics: Taking 174 cases treated by cholecystostomy in St. Thomas's Hospital in the years 1911–28 inclusive, and in which the after-history could be ascertained, 49 per cent. remain cured up to date, 22 per cent. relieved, that is to say, benefited but still suffering some digestive disturbance, and 29 per cent. must be accounted failures. Of these unsatisfactory cases 35 have re-entered the hospital for further operative treatment, the secondary operations revealing the following conditions: Acute cholecystitis 3 cases, 1 without stones, 1 with stones in the gall-bladder, and 1 with stones in bile-duct; chronic cholecystitis 31 cases, 8 without stones, 14 with stones in the gall-bladder, 7 with stones in the common bile-duct, and 2 with pancreatitis; carcinoma of the gall-bladder, 1 case.

It was largely owing to the very high percentage of unsatisfactory results following cholecystostomy, to the more intensive study of the underlying pathology, and to the appreciation of the fact that cholecystectomy in skilled hands is no more dangerous, that cholecystectomy became the operation of choice. In confirmation of the statement that cholecystectomy is no more dangerous than cholecystostomy, the following figures at St. Thomas's Hospital, though admittedly few in number, may be given. 146 cases of cholecystostomy, amongst which acute cholecystitis was present in 16 per cent. and gross chronic cholecystitis—that is to say, of such severity as to render the operation technically difficult—in 56 per cent. showed a mortality of 9 per cent., whilst 80 cases treated by cholecystectomy, amongst which acute cholecystitis was present in 23 per cent. and gross chronic cholecystitis in 75 per cent., showed a mortality of 6 per cent., and a further series of 97 cholecystostomies and 315 cholecystectomies show a similar result. It is of interest to note the complete reversal of the ratio of frequency of the two operations in late years.

Cholecystectomy deals radically with the possibilities of a focus of chronic infection, and of a factory of calculi, but unfortunately, in many cases, we shall be locking the stable door after the horse has gone, and the evils produced by the gall-bladder while in situ will remain. Mere removal of the gall-bladder may do little to remedy associated cholangitis or pancreatitis, and thus we find after cholecystectomy a definite proportion of unsatisfactory results. Thus 176 cases treated by cholecystectomy show 73 per cent. as cured, 16 per cent. as relieved, and 11 per cent. as failures. This percentage is composed of cases of pancreatitis acute and chronic, of obstructive jaundice due to inflammation or calculi, and of biliary colic. Similar figures are seconded by Whipple, by Müller,[17] and by Rowlands.[18] The figures for cholecystectomy show a definite improvement over those for cholecystostomy, and are comparable if either operation is combined with exploration of the common bile-duct. The actual cause of failure in these cases, then, may be the presence of stones in the bile-ducts, stenosis of the ducts, or persistent cholangitis and pancreatitis, and it follows that when any of these conditions are found or suspected at the original operation, very serious consideration must be given to the advisability of removing the gall-bladder. It has been shown by Burden,[12] and by Judd and Counsellor, all of the Mayo Clinic,[19] that cholecystitis is nearly always accompanied by cholangitis of the chronic inflammatory type which is ultimately productive of stricture and is likely to influence the result of operations for the relief of common duct obstruction, and explains the frequency with which incomplete intermittent obstruction follows plastic operations for the relief of strictures of the bile-ducts (see Fig. 1). Cases manifesting recurrence of symptoms after cholecystectomy constitute one of the most difficult problems in surgery. As a result of impaired function of the liver the patients are seldom good operative risks; the presence of obstructive jaundice introduces the danger of serious hæmorrhage, and the technical difficulties of identifying the diseased structures may be very great owing to the presence of adhesions and the fact that the natural signpost to the ducts—namely, the gall-bladder—is lacking. When ultimately the knot is unravelled the problem of what can or what ought to be done has still to be faced. In such cases Walters,[20] from his work in the Mayo Clinic, considers that the successful treatment of strictures in the bile-ducts depends on the presence of enough duct on the proximal side of the stricture to permit of accurate anastomosis to an opening in the duodenum as well as that a minimal amount of infection should exist in the biliary passages, but that, in view of the frequent infection present, recurrent symptoms of intermittent obstruction are likely. Judd [21] agrees with these views, and points out that in certain cases in which the segment distal to the stricture is located readily and appears healthy, end-to-end anastomosis of the duct is preferable, but that the anastomosis should be performed over a Kehr Deaver T-tube allowing of prolonged drainage of bile to the exterior, a point he regards as essential. If the operation of anastomosis of an hepatic duct to the alimentary canal proves impracticable, the only possibility is the production of an external biliary fistula followed by an attempt subsequently to dissect out and anastomose the fistulous track to the gut as described by Lahey,[22] of Boston. In all cases prolonged drainage is to be aimed at, and after any of these complex and difficult operations a recurrence of symptoms is to be feared. The desirability of drainage in such cases has been emphasised in this country by Moynihan. In view, therefore, of this opinion that in all cases where the common duct is or is likely to become obstructed, with consequent biliary stasis, a long period of drainage or even permanent drainage is desirable and that, in all cases in which the cystic duct remains patent, the gall-bladder offers the possibility of permanent drainage, would it not be sound practice to utilise it in a short circuit? After such a short circuit, stasis within the biliary tract seems unlikely, and consequently calculus formation is improbable. In the absence of calculi carcinoma is exceedingly rare, and the abolition of stasis by free drainage should have a beneficial effect on latent infection throughout the biliary tract and upon hepatic function.

By the term short circuit we can be taken to mean the operations of cholecystgastrostomy and cholecystduodenostomy as anastomosis to the rest of the small bowel or colon are more difficult to perform and more divergent from the normal anatomy of the biliary tract.

The suspicion with which short circuit operations are regarded is undoubtedly due to the fact that they have been performed almost entirely in cases of obstructive jaundice due to malignant disease in the head of the pancreas, and the figures showing the survival period after the operation under such conditions are certainly not encouraging. Thus the proven cases, 25 in number, operated on in St. Thomas's Hospital during the last nine years, all succumbed within nine months of operation, and 17 within six weeks. Undoubtedly not enough attention has always been paid to technical details such as the preoperative preparation of the patient against the risk of hæmorrhage, but if the patients survive the operation their condition is greatly alleviated as pointed out recently by Walters and McVicar,[23] and death is due to spread of carcinoma and interference with the pancreatic function and in no sense to the short circuit operation as such.

If we examine the results of this type of operation when carried out for the relief of inflammatory conditions in the bile passages we find a very different state of affairs. I have collected all the cases I could find of this type, 18 in all, performed at St. Thomas's Hospital, and all having been performed since 1923; in more than half the operations were done by me personally and all the patients are alive and well, whilst the majority are cured completely of their symptoms. Further, experimental animals can be maintained in perfect health and condition after such an operation. Having established the fact then that, speaking generally, the results of a short circuit when performed for the relief of an inflammatory lesion are good, let us consider in detail any theoretical or established objections to the procedure taking the various points seriatim.

In the first place it has been doubted whether it is possible to produce a permanent and adequate anastomosis between the alimentary canal and the gall-bladder, unless the common bile-duct is obstructed completely, a state of affairs not likely to be the result of inflammation. I have had an opportunity of observing two cases, one five months and one two years after operation, and in each case the stoma was as large as when made and the same is true in experimental animals. I feel sure that an opening that will admit the little finger is desirable, and both Deaver and Wangensteen [24] of Minneapolis, strong advocates of the operation, consider an adequate anastomosis very important as otherwise cholangitis is liable to persist.

The second point is the practicability of utilising the gall-bladder for the formation of an anastomosis seeing that in these cases the gall-bladder will be diseased. Obviously it is essential that the continuity of the cystic duct should not have been destroyed, for if so the operation will be useless. The presence of inflammation in the gall-bladder is no bar to the operation provided the condition has not progressed to the extent of gangrene. In one of my own cases acute cholecystitis was present consequent on the impaction of a stone in the neck of the gall-bladder. On tapping it and pushing back the impacted stone, the condition of the viscus improved at once as shown by free bleeding and change in colour. An anastomosis was therefore made with the stomach, and the patient made an uninterrupted recovery and was so well satisfied with her condition that, three years later, she advised her mother, aged 70, to come to London from a considerable distance because she also suffered from cholelithiasis. A microscopic section of the gall-bladder wall in this case showed it to be densely infiltrated with polymorphonuclear leucocytes. Chronic inflammation, unless accompanied by gross fibrosis or destruction of the mucous membrane, does not make the operation impracticable and, in this connexion, it may be remembered that the mucous membrane is often surprisingly little affected.

Thirdly, it has often been stated that after a cholecystgastrostomy the presence of bile in the stomach gives rise to nausea or even vomiting from gastric irritation. In all my personal cases and in those which have come under my observation, vomiting has been conspicuous by its absence. This, however, leads us to a more important point—namely, the effect of bile present in the stomach on gastric function. I have investigated gastric curves in five cases after cholecystgastrostomy and these are all within the normal range and correspond to the preoperative curves, although the resting juice in every case and the subsequent samples in most were stained with bile. This fact has been noted by other observers—namely, Oddi,[25] Dastre,[26] so long ago as 1888–90, and more recently in America by Beaver,[27] Grey,[28] and others. Here it should be noted that it seems unlikely that the operation can have any beneficial effect in the treatment of gastric ulcer as has been claimed.

The next point that suggests itself is that even if the passage of bile into the stomach has no effect on gastric function, is the converse equally true that contact with the gastric mucosa has no effect on bile as a participant in fat metabolism? I have not been able to detect any interference with fat metabolism in experimental animals previously subjected to a short circuit even in the presence of total obstruction of the common bile-duct by ligature carried out at the same time, the amount of fat in the fæces and the percentage of split fat being quite normal. Clinically there is no evidence of impaired fat digestion in cases of inflammatory disease, but this is in contrast with what occurs in the bile-ducts as pointed out by Burden[12] and affecting the pancreas as shown by Deaver and Sweet[13] and by Graham.[14] One might point out in this connexion that little information is extant about the fate of these associated lesions following cholecystectomy. How common infective changes are outside the gall-bladder itself is shown by the fact that in 281 cases of cholelithiasis which I[15] investigated and in which stones were limited to the gall-bladder jaundice occurred at some stage in 36 per cent. Fig. 1 shows well-marked infective changes in the hepatic portal sheaths in a subject suffering from stones limited to the gall-bladder and treated by cholecystectomy.

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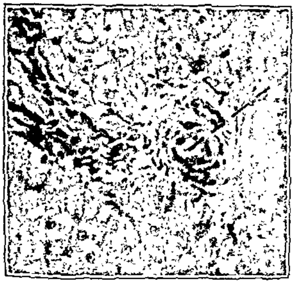
The microscopical findings at the time the animals were killed can be considered throughout the various parts of the biliary tract. In the gall-bladder itself, particularly near the stoma, there is definite thickening of the wall and more than would be accounted for by mere collapse of the viscus. Examine the photographs showing a normal cat's gall-bladder in the state of distension and a similar bladder in the state of collapse. There is apparent thickening due to contraction as pointed out by Boyden. Fig. 3 shows a gall-bladder removed one year after cholecystgastrostomy which was performed in January, 1928, and the animal killed in January, 1929. Three things are noticeable. First, the tremendous hypertrophy of the unstriped muscle; secondly, the deepening of the mucous membrane; and, thirdly, the absence of inflammation. The hypertrophy of muscle is more obvious even in sections stained by Mallory's method and presumably due to submission of the gall-bladder to the peristaltic pressure of the stomach. The deepening of the mucous membrane is very marked near the anastomosis and is shown in Fig. 4, when on the one hand we have gastric mucosa and on the other hypertrophic gall-bladder mucous membrane. This last point has been noted previously by Smith [41] of St. Louis. The absence of inflammatory reaction is shown by examination under a higher power.

FIG. 5.

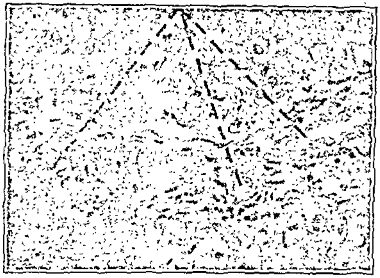


Normal cat's liver, showing a portal sheath. B.-d. = bile-duct.

Bacteriological examination in these experiments was of interest, for whereas culture from the gut and lumen of the gall-bladder showed growth of *Bacillus coli* and streptococci, the wall of the gall-bladder and cystic duct, and also the liver in both the peripheral and deeper portions, including the larger bile-ducts, proved sterile on culture in serum glucose broth both aerobically and anaerobically.

When the effect on the liver itself was studied the microscopic appearances were normal and microscopically as a rule nothing abnormal could be detected. Fig. 5 shows normal liver with one of the small hepatic portal sheaths and Fig. 6 a similar specimen from a cholecystgastrostomy, the animal being killed twelve months subsequently. These may be contrasted with Fig. 1 taken from a human liver in a subject suffering from cholecystitis. In one case of cholecystgastrostomy and ligature of the common bile-duct some changes in the portal sheaths appeared to be present, but even in this case the liver and walls of the biliary passages were sterile in culture, although the mucous membrane showed catarrhal inflammation. This is in very sharp contrast with the experimental results reported in America, where gross infection was the rule, and accords more with the reported good clinical results.

FIG 6.



Cat's liver 12 months after cholecystgastrostomy.
B.-ds. = bile-ducts.

I would claim, therefore, that after the short circuit operation there is no bacteriological or gross histological evidence of ascending cholangitis, although it is possible that this may occur as a transitory phase during convalescence from the operation, or in the presence of complete obstruction of the common bile-duct, and, incidentally, total obstruction is never produced by inflammatory changes. I hope to undertake further experimental work on this point.

Judd,[42] in a consideration of the results of side-tracking operations, states "that infection is not as apparent clinically as might be expected from a study of experimental animals after operation, and that in the cases in which the gall-bladder has not been removed and in which the cystic duct is patent so that there is bile in the gall-bladder, the preferred operation is cholecystgastrostomy. This operation can be carried out easily." I can corroborate this. Whipple [43] of New York records similar experience.

TECHNIQUE OF OPERATION.

As regards the actual technique of a short circuit operation in man, the best exposure is obtained by an incision through the sheath of the right rectus muscle with outward displacement. In the majority of cases cholecystgastrostomy will be the operation of choice as an adequate stoma—that is to say, one admitting the little finger—can be made, and the anastomosis can be performed outside or flush with the abdominal wound, permitting of adequate packing off from the general peritoneal cavity. This is an important point because after incision of the gall-bladder infected bile and stones will have to be evacuated. Personally I never use clamps as I find them a hindrance and apt to damage the delicate tissues, and I use two layers of continuous sutures, the inner being inserted in the manner described by Connell. Performed in this way the anastomosis should be perfectly secure, and it is unnecessary and definitely inadvisable to tack omentum to the suture line. The actual site of the stoma is found to lie most conveniently on the anterior surface of the pyloric antrum about an inch to the left of the pylorus.

In certain cases where the patient is thin or the duodenum mobile cholecystduodenostomy will be found equally easy to perform, but owing to the limited peritoneal coverings of the duodenum it will be found impossible to make as large a stoma, the size of a lead pencil being the largest possible and the anastomosis will lie in close juxtaposition to the pylorus. I always close the abdomen in layers without drainage, and in the human subject have never experienced any leakage at the suture line. In experimental animals the gall-bladder is so thin that it is impossible to insert a truly sero-serous stitch which does not transgress the lumen at any point and for this reason I have had trouble from leakage in two experiments. In man radiograms taken subsequently have failed to demonstrate any pyloric deformity or delay six months after the operation, by which time any cicatrisation likely to supervene should have occurred. Unless it is obvious that cholecystduodenostomy can be performed with ease and safety, I should say that cholecystgastrostomy is the operation of choice. The convalescence of these cases is remarkably smooth, the average duration of stay in hospital after the operation being 18 days; there is no need for frequent dressings and there is no loss of bile to the exterior with consequent impairment of nutrition. The risk appears to be small as I have collected 18 cases without a fatal result. Stasis in the biliary tract is avoided and a permanent safety valve provided. Associated lesions, such as a stone in the common bile-duct, if removable, should be dealt with at the same time.

The Table shows in some detail a summary of the 18 cases of short circuit performed for inflammatory conditions in the bile passages. I would emphasise again that these 18 cases are not in any sense selected but represent all the authentic cases of short circuit for inflammatory conditions performed at St. Thomas's Hospital I could collect. The mortality was nil and the end-results up to date give as cured and two as relieved, while none are definitely failures.

Eighteen Cases of Short Circuit of Cholelithiasis.

Case.	Sex.	Age.	Length of history in years.	Jaundice.	Nature of symptoms.	Operation findings.	Date of operation.	Type.	Result.
1	F.	29	1	+	Cc. 1922.	Panc.	4/4/23	Cd.	C.
2	"	66	4	+	Cc. 1919.	Panc.	18/7/23	Cd.	C.
3	"	43	1	+	A. colic.	Panc.; st.	30/4/26	Cg.	C.
4	"	45	1	–	"	St. in g.-b.	31/10/26	Cg.	C.
5	"	49	1	–	"	"	15/12/26	Cg.	C.
6	"	52	1	–	"	"	22/2/27	Cg.	C.
7	"	52	3	–	"	"	7/4/27	Cg.	C.
8	"	63	8	–	"	"	12/5/27	Cg.	R.
9	"	53	20	–	"	"	22/6/27	Gg.	C.
10	M.	60	1	+	"	"	19/8/27	Cg.	C.
11	F.	36	3	+	"	"	26/5/28	Cg.	R.
12	"	50	1	+	"	"	31/5/28	Cg.	C.
13	"	69	20	+	Cc. 1926	Panc.	16/8/28	Cg.	C.
14	"	55	1	–	A. colic.	St. in g.-b.	28/3/29	Cd.	C.
15	"	52	8	+	"	Panc.; st.	30/5/29	Cd.	C.
16	M.	44	2	+	"	St. in g.-b.	8/7/29	Cg.	C.
17	"	63	7	+	"	Panc.; st.	4/9/29	Cd.	C.
18	"	67	1	+	"	St. in g.-b. and c.b.-d.	9/9/29	Cg.	C.

Cc. = cholecystostomy. Cg. = cholecystgastrostomy. Cd. = cholecystduodenostomy. A. colic = attacks of colic. Panc. = pancreatitis. St. = stones. G.-b. = gall-bladder. C.b.-d. = common bile-duct. C. = cured. R. = relieved.

One of the cases relieved was an early case in which I tacked the omentum round the anastomosis and the patient also suffered considerable post anæsthetic bronchitis as a result of which there must have been partial failure of union in the peritoneal suture line. Dense adhesions formed, obstructing the pyloric end of the stomach and necessitating laparotomy for their division; from the point of view of the biliary tract the result appeared good. The gall-bladder wall was soft and supple, the stoma unchanged. The patient expresses herself, three and a half years later, as definitely improved, has gained over a stone in weight, and when I saw her recently appeared to merit the description of cured. The other case was one which the doctor describes the patient as still suffering dull pain in the stomach, but otherwise the condition is good. In this series you will see there were 13 cholecystgastrostomies and five cholecystduodenostomies, and that in 11 there was clinical evidence of cholangitis—that is to say, jaundice before operation—and corroborated by microscopic changes in the ducts at operation in 7.

CONCLUSIONS.

What place in the treatment of inflammatory conditions of the bile passages should a short circuit operation occupy? I think it fair to say that in all cases where obstructive changes are present or suspected or are deemed likely to supervene in parts of the biliary tract other than the gall-bladder permanent relief of symptoms is produced. My own results lead me to favour the view that where the gall-bladder is comparatively healthy except for the presence of calculi and the cystic duct is patent, it should prove the operation of choice in cholangitis, in stricture, and in any case where the head of the pancreas is found to be hard. Published statistics of other operations undertaken for similar conditions after removal of the gall-bladder has been previously carried out are not so satisfactory. Although some authorities produce experimental evidence of invariable infection in experimental animals there is no clinical evidence of this, and I have carried out experiments in animals without producing demonstrable infection. I have carried out the operation in man with success and the absence of any clinical evidence of subsequent infection in cases where disease was considered to be localised to the gall-bladder alone. But in view of the conflicting opinions as to the risks and degree of ascending infection, I think further evidence must be obtained before the operation can be regarded as an alternative to cholecystectomy for this type of case.

In conclusion, I should like to thank Dr. T. H. Wilson, my house surgeon, who made the microphotographic preparations; Dr. W. J. Griffiths, who carried out or supervised the chemical investigations; and, above all, Sir Cuthbert Wallace for his encouragement and for giving me the facilities of the Surgical Unit.

REFERENCES.

1. Mentzer, S. H.: Arch. Surg., 1926, xiii., 511.
2. Boyd, W.: Brit. Jour. Surg., 1922, x., 337.
3. Halpert, B.: Bull. Johns Hopkins Hosp., 1927, xl., 390.
4. Boyden, E. A.: Anat. Rec., 1925, xxx., 333.
5. Kodama, S.: Surg., Gyn., and Obstet., 1926, xliii., 10.
6. Judd, E. S., and Mann, F. C.: Ibid., 1917, xxiv., 437.
7. Wilkie, D. P. D.: Brit. Med. Jour., 1928, i., 508.
8. Rosenow, E. C.: Jour. Infect. Dis., 1916, xix., 527.
9. Wilkie, A. L.: Brit. Jour. Surg., 1928, xv., 450, and xvi., 214.
10. Graham, E. A.: Surg., Gyn., and Obstet., 1918, xxvi., 521.
11. Judd, E. S.: Jour. Amer. Med. Assoc., 1921, lxxvii., 197.
12. Burden, V. G.: Annals Surg., 1925, lxxxii., 584.
13. Deaver, J. B., and Sweet, J. E.: Jour. Amer. Med. Assoc., 1921, lxxvii., 194.
14. Graham, E. A., and Peterman, M. G.: Arch. Surg., 1922, iv., 23.
15. Robinson, R. H. O. B.: St. Thomas's Hosp. Reps., 1922.
16. Moynihan, Berkeley: Brit. Med. Jour., 1928, i., 1.
17. Müller, G. T.: Jour. Amer. Med. Assoc., 1927, lxxxix., 786.
18. Rowlands, R. P.: THE LANCET, 1929, ii., 1075.
19. Judd, E. S., and Counsellor, V. S.: Jour. Amer. Med. Assoc., 1927, lxxxix., 1751.
20. Walters, Waltman: Surg., Gyn., and Obstet., 1929, xlviii., 305.
21. Judd, E. S., and Parker, B. R.: Arch. Surg., 1928, xvii., 1.
22. Lahey, F. H.: Jour. Amer. Med. Assoc., 1923, lxxx., 893.
23. Walters, Waltman, and McVicar, C.: Ann. Surg., 1929.
24. Wangensteen, O. B.: Ibid., 1928, lxxxvii., 54.
25. Oddi, R.: Archiv. Ital. de Biol., 1888, ix., 138.
26. Dastre, A.: Archives de Physiol., 1890, ii., 315.
27. Beaver, M. G.: Arch. Surg., 1929, xviii., 899.
28. Grey, E. G.: Jour. Exper. Med., 1916, xxxiii., 15.
29. Robinson, R. H. O. B.: THE LANCET, 1929, ii., 540.
30. Tallerman, K. T.: Quart. Jour. Med., 1923–24, xvii., 37.
31. Gatewood, and Poppens, P. H.: Surg., Gyn., and Obstet., 1922, xxxv., 445.
32. Horsley, J. S.: South Med. Jour., 1927, xx., 669.
33. Lehman, E. P.: Arch. Surg., 1924, ix., 16.
34. Deaver, J. B.: Ann. Surg., 1925, lxxxi., 761.
35. White, C. S.: Surg., Gyn., and Obst., 1920, xxxi., 493.
36. Du Bose, F. G.: Ibid., 1924, xxxix., 295.
37. " " : South. Med. Jour., 1927, xx., 674.
38. Jacobson, J. H.: Amer. Jour. Obst., 1914, lxx., 825.
39. Moore, C. A.: Brit. Med. Jour., 1921, ii., 826.
40. Stretton, J. L.: Ibid., 1922, ii., 600.
41. Smith, G. M.: Jour. Med. Res., 1912, xxvii., 399.
42. Judd, E. S.: Jour. Amer. Med. Assoc., 1928, xci., 300.
43. Whipple, A. O.: Ann. Surg., 1927, lxxxvi., 540.

ATHLETICS IN SCHOOLS.

Introducing a Discussion at the Hunterian Society on March 24th

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I RECOGNISE that you want from me the facts and experiences of my 27 years' service as a public school medical officer, covering the medical and athletic records of over 4500 boys, and though statistics may be the refuge of the intellectually destitute, they may have their uses. I may find it difficult to avoid the athletic standpoint, as I have had a humble though lifelong active participation in all school sports, except rowing, boxing, and long-distance running.

Challenging Voices.

It is rather over twenty years ago since the question of abuse of games and runs in schools was fully discussed by the Medical Officers of Schools Association, owing to a letter in the public press, signed by four of the most eminent doctors of the day, condemning all runs of over one mile in length. The result of a two days' debate was a general approval of the way games and the like were managed. We have possibly lived in complacent self satisfaction, I hope not in a fools' paradise, since then, and it is an excellent thing that we should once again review our actions and policy, the more so as history has repeated itself and, a year ago, another very distinguished member of the profession made a sweeping attack in the public press on the management or rather want of management of sports and athletics in public schools. The charges made were so serious, that I and several of my colleagues wrote and challenged the accuracy of the article, and received the reply that the statements did not apply to us personally. As this article bears directly on to-night's discussion, I will quote from it:—

> "So many instances of the very deleterious results of excessive exercise upon both girls and boys have come under observation recently, that it seems advisable that some definite control should in future be exerted upon the amount of exercise which each pupil shall, after adequate examination, be considered capable of, on entry into school.
>
> "That the headmaster or mistress should exert this control of exercise is utterly ridiculous, and the many examples of serious harm, and in one instance of death, which have resulted in consequence of excessive exercise in individual cases, shows that the question of games and exercises urgently calls for the closest attention.
>
> "The craze for games in our public schools is carried to a ridiculous length, and the powers of a headmaster to order a growing boy, who does not play cricket or football, to run as many as seven miles a day is simply intolerable.
>
> "In several instances, in consequence of this overstrain in growing lads or girls in important public schools . . . the health or even the lives of the pupils have been endangered or permanently deteriorated."

The writer goes on to compare our system unfavourably with that adopted in other countries. Now the fact, which is I believe unique, that games are compulsory in public schools in England, makes it all the more important to meet if possible this charge, based apparently on definite facts. I have therefore reinforced my own experience by that of the medical officers of 30 of the large public schools, embracing over 16,000 boys, and covering periods of from 3 to 30 years.

Exercise of Control.

The first point is the amount of control exerted by the school medical officer. This necessarily varies, according as the medical officer is whole or part time, but with one exception, all my correspondents express themselves as satisfied with their powers of control and management. Indeed, quite a number speak of absolute power of veto and complete control. It is also true that our advice is sought and generally followed on many aspects of school games, while so much care is taken for the weakly individual that it might be said of us: "So careless of the type we seem, so careful of the single life."

At the same time, it is equally true to say that changes, not necessarily for the good, can readily creep in without our knowledge, and it is of course also true that we are all of us liable to make mistakes or errors of judgment. Boys are just as foolish as we were, and perhaps more emancipated, and they need constant watching, as regards the regulations they make. Arm-chair administration or supervision will certainly allow abuses to develop, and constant observation on the part of the medical officer is the only real safeguard.

There is one school, in which the medical officer of several years' standing (who has since retired) states that he had no control, that his advice was not sought, that there was no proper supervision over training, that boys overtrained hopelessly, that frequent fainting had occurred on long cross-country runs, and that games began immediately after meals. It is true that nothing disastrous had happened so far.

Fatalities.

These are surprisingly few—a total of six in the last 20 years. Of these, four were pure accidents: one diving from a forbidden height, one fractured skull from a cricket ball, one palmar abscess and septicæmia also from a cricket ball, one ascending myelitis following a football injury. The fifth was a sudden death on the football field in a previously healthy boy two hours after his dinner. Post mortem nothing abnormal was found either macro- or microscopically, but there was undigested food in the stomach. The sixth case is considered doubtful by the reporting medical officer. A boy who had had slight tonsillitis, high-jumped eight days later, and ran a short race ten days later; he developed heart symptoms, and died seven months afterwards from infective endocarditis.

Very near to death were two cases of fractured cervical spine which both recovered, and the remarkable cases of a depressed fracture of the skull at football, which was immediately taken to hospital, operated on, and was back in bed before the end of the game. Quite recently a case was reported of a girl of 15 who died suddenly on the hockey field, the coroner recording a verdict of heart failure following exercise after a heavy meal.

Disability.

The next question concerns severe disabilities—i.e., those causing long or even permanent incapacity. Here one is on much less sure ground, owing to the different value that may be attached to the word "severe"; but 25 schools record no known instance, and five others record ten cases: of these six followed rowing, and four followed cross-country running—two of the latter being boys who had recently had mild influenza.

I had myself remembered and known of no such cases, but wrote to some 30 old boys, of whom I had records of cardiac disability, in which school exercise might have been a factor. With one exception, all who replied, 20 in number, said that they had been all the fitter for their school exercise, and several of them reported a very strenuous after-life, such as boxing for years for a living, prospecting, digging for oil, winning a competitive 45-mile walk, hunting big game, and active service in the Army. The single case is that of a man who came to the school with a previous history of rheumatic fever, who attributes his breakdown to a three-mile run. He was taken away from school and has undoubtedly been permanently affected. This was 27 years ago, just after I went to the school.

I also wrote an open letter to the school magazine, asking any old boy who considered he had suffered any ill-effects as the result of the exercise at school, to write to me: I have had a number of answers, but all of them so far praising the system, and stating that they derived nothing but benefit. Such a negative reply may not of course be worth much.

Possible Abuses.

So far I have referred to the past, but my last question to myself and my colleagues was about possible abuses, such as excessive amount of exercise, unequal grouping both of age and physique, short time after meals or playing games too soon after some illness.

Excess.—Whether it is a sign of advancing years, or of increased experience, I know not, but I do feel that there is some evidence of the intemperance of physical exercise. To be "cock house" is the overriding ambition of the average healthy-minded, and in the autumn and spring terms he will do much to secure this. The intemperance shows itself, not in a complete breakdown, but more in general fatigue and lassitude, loss of weight, diminished and inferior intellectual output, crying out for less work, both mental and physical. This condition is seen in the strong robust types, not seldom in the heads of houses or XVs., who have a very full life; it is not serious in them and soon recovered from, but it more serious and important in the young promising athlete. The above symptoms are also often seen in cases of slight concussion, which have not been reported or noticed at the time.

Football is now the tyrant. Immature house captains may be veritable slave-drivers, and their partisan zeal, or as Dukes said: "The enthusiastic impulses of exuberant youth," praiseworthy from many points of view, and not infrequently shared by young and keen house masters, may, I feel sure, lead to excess, and the young colt of under 16 in particular does need safeguarding, not only for his own health, but also, if I may so, for the good of his own game, and therefore for his house. From this point of view, I have long urged what I call the N.C.C., that is, an occasional "non-compulsory changing day," when a boy need only play or take exercise if he wants, not because he must. I am glad to find that this is advocated by some other school medical officers.

Runs, both road and cross-country, have undergone a remarkable change in my experience. Twenty-five years ago, runs of 1¾ and 3 miles were the shortest; they might be run three or four times a week, and the younger the boy, the more often he ran them. Cross-country runs were in vogue. Nowadays these 1¾ and 3-mile runs are the longest routine runs; they are run much less often, and one of the present usual exercise runs is rather less than a mile on grass with posts fixed at varying intervals for mixed sprinting and walking. This was introduced to diminish the number of deadly dull road runs, so generally disliked, and also to try to increase our pace, in which, as a school we are deficient (due partly to this, and also to our clay soil which makes for endurance rather than for speed). I think we have cut out runs too much, especially for the bigger boys for training purposes; the more so, as I have never seen any harm from them (except for the one case quoted previously) except to the feet. And here I must protest against the use of heelless gym shoes for road runs by young boys. This is definitely harmful, and dropped arch, and bruised and painful heels are a common result.

To the parent, however, the school run still seems to imply a 5 to 10-mile run at racing speed over difficult country, probably spurred on by some stern prefect, and I am still being often asked by them or the home doctor to give leave off. As a matter of fact, asthmatics are about the only ones who should be excused.

The *competitive steeplechase* is totally different. As with all other sports, it is primarily a house concern, and six picked boys from each house enter. The distance is about 3½ miles over a difficult and heavy country, and is undoubtedly a great test of endurance. The increased difficulties of the course have gone hand in hand with the virtual elimination of cross-country running, and shows the need for constant care on our part. Entrants should be over 16, and should have been vetted by the medical officer in some efficient way. I have known of three cases in which the heart was temporarily strained, and vomiting is not uncommon.

To judge from the answers received from other schools, the number and length of all runs is diminishing, and I have accumulated almost no evidence of a harmful effect on the health of school boys from the ordinary routine runs of the present day, but opinions are much more guarded on the competitive steeplechase, for which most but not all medical officers insist on a previous examination.

Swimming.—This most fascinating sport also has its danger, in that it is very fatiguing; the danger is the greater, because the fatigue is very insidious and the pleasure so great that boys will not admit it. Twenty minutes a day should be the maximal allowance (except for the early morning dip), and life-saving practice should count as a bathe. It is my experience that the sick admissions invariably go up as soon as the bathing season begins, though to a much less extent since the length and number of bathes were cut down, and the ear and catarrhal subjects were forbidden to bathe.

Unequal grouping.—As regards physique, unequal grouping is on the whole rare, though it inevitably occurs in house matches; and indeed in any game of football the strongest player must be much stronger than the weakest. There is, however, a definite danger as regards age, especially in boxing. It is surprising what a difference two years in age may make between boys of the same height, weight, and apparent strength, and I have seen the nerve of three very promising boxers broken for this sport in consequence.

Time after meals.—Twenty years ago the Medical Officers of Schools Association laid down as a result of the debate to which I have alluded, the following: "It is most important that there should be an ample interval (one hour at least) between the time of the previous meal and the beginning of exercise. There is clear evidence that the neglect of this elementary rule is responsible for a very large proportion of the ills which have been attributed to over-exertion alone." A leading article in the *British Medical Journal* in the same year said: "The only direction in which outside stimulus is perhaps required is in respect of a due interval being allowed to elapse between meals and the commencement of a game."

At that time, after six years' experience, I wondered if I had been missing such cases, and after another 20 years I am still wondering, as to my knowledge I have seen none, though I know that this rule is and has been constantly violated. If the "one hour limit" refers to runs and football, then I certainly agree, though even in the latter the small boys have played short games within 40 minutes of a meal for many years. Apart from these two, squash, fives, rackets, gym, fencing, tennis, cricket, and sprint racing have been constantly indulged in half an hour after dinner with no ill-effect, so far as I can judge.

Exercise and the Heart.

The fact is that the juvenile stomach is as elastic and long suffering as the heart, and that brings me to the most important consideration: "Is the healthy adolescent heart ever impaired by exercise?" So far as my limited experience goes, the answer is in the negative, and to quote Clifford Allbutt, "In all cases of heart disability, some infectious disease, however slight, had preceded the physical stress." Undoubtedly cases of cardiac strain and disability do occur from time to time, some of which are brought to light by some form of exercise, and the commonest causes are, *not* an attack of measles, severe influenza, diphtheria, or scarlet fever, which we can and do guard against, but the slight chill or even cold, or the milder forms of influenza, which occur so often in a big epidemic, and which to me are always a cause of great anxiety.

The difficulties are increased from the start by the fact that there is so much variation in the healthy adolescent heart, and I might add in the opinions expressed by the home doctor, the school doctor, and the cardiologist, and I agree with Dr. W. Atlee when he says, that in the absence of gross lesions, easy to detect, "one symptom is worth many physical signs, and exercise tolerance tests are the most practical value." I do not mean to belittle the value of examination. Primary examination of *all* boys on entry is of course essential, and re-examination of all delicate and suspects; but it is not among them that the danger of heart strain following exercise is most likely to develop. Regular re-examination of the whole school, advocated by many, would not, in my opinion, solve the difficulty. To examine 500 boys from the cardiac point of view, allowing 10 minutes a boy, would take 84 hours, and allowing 2 hours a day, 42 days. Much can happen in 6 weeks.

My own system, after any boy has been sick, is to leave off all exercise for three days, and then order gentle exercise for another three days or a week. This is gradually increased, football and runs being further curtailed, according to the results of my examination.

Exceptional Cases.

There are two types of boys who need a passing reference. One, the pre-puberty endocrine defective, generally of the obese variety, and often overgrown, who is capable of very little, till after puberty; and next the albuminurics. So long as a watchful eye is kept on the urine and general condition of the latter they may be allowed full exercise. Early in my career I remember two cases, whose urine contained albumin in large quantities, and whose athletic careers and characters suffered considerably from drastic efforts to stop the albuminuric leakage.

The boy who is debarred from all games is a great rarity, but many are partially barred, the one game that counts amongst them being football. Are there any bad effects as a result? Amongst the schools I consulted, five medical officers consider that bad moral effects must result, though no direct evidence has been produced, except in one instance. All the rest agree that it is very desirable that the energies of such boys should be directed into other channels.

The opinion is by no means uncommon amongst house masters, whose judgment cannot be dismissed lightly, that immorality is to be feared among this type. In my own opinion, the question of immorality depends almost entirely on the standard and tone of the school or house, but there is a definite tendency for such boys to become loafers, unless those in charge take the trouble to find some more or less congenial substitute—e.g., photography, engineering, carpentry, linesman, goal at soccer ("the haven of the tired heart"), golf, squash, fives, tennis, fencing, gym (the dangers of which have been much exaggerated), or the short go-as-you-please run, which is a glorified walk.

Athletics and Intellect.

Though not directly connected with the subject, it is worth while recording the relationship between these two. An analysis of 4500 boys who have passed through my hands shows that 39 per cent. of scholars gained school athletic distinctions, while 18·8 per cent. of the rest of the school did so. Of the scholars, those who only got junior scholarships on entry, and gained no further distinction, only produced 7·7 per cent. of athletic successes.

Athletic Sports.

These have undoubtedly become much more popular in post-war years. Every boy must enter for at least one event, and more than half the school do take part, and the heats are spread over three or more weeks. Unfortunately they seem to be associated generally with east winds, rain, or snow, and the risk of catching chills is a real one, and for purely medical reasons I should much prefer them to be held at the beginning of the summer term. Coaching and organisation has improved, and care is taken that the longer races are run on different days. Relay races were introduced here as far back as 1905. No boy should be allowed to compete out of his own class, a not uncommon happening, especially in the relay team races. It would be a good thing to limit the number of prizes that any one competitor might take.

Conclusions.

My conclusions, for what they are worth, are that games and sports in the bigger schools are on the whole very well managed and supervised, and that there is surprisingly little evidence of damage resulting At the same time, constant care is needed on the part of the medical officer and others to see that youthful enthusiasm does not lead to undue excess, and it is in the most healthy and vigorous type of school and boy that such excess is likely to occur. The truly healthy boy rarely, if ever, suffers any real harm, though he may overdo it at times. The real risk lies in boys playing games or running after some minor illness, generally slight influenza, and in times of epidemics it is impossible to be sure that no unfit boy takes part. Re-examination will not necessarily be a safeguard, as in so many cases, symptoms precede signs. In addition, if it is to be genuine, and not mere eyewash, the time involved makes such a method very difficult.

I think that routine runs of all sorts have diminished largely both in frequency and length the last 20 years, and in this respect the pendulum has swung too far. Properly graduated, they are entirely free from danger. The competitive steeplechase is, however, a potential danger, and needs close supervision, especially where ordinary cross-country runs have died out. The occasional non-compulsory changing day is of great value.

PATHOLOGY OF COLIFORM INFECTION OF THE URINARY TRACT.*

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IN my brief survey of the pathology of colon bacillus infections I intend to confine my attention rigidly to those cases in which no gross lesion of the urinary tract can be found. To include cases of long-standing urinary obstruction associated with such secondary changes as dilatation of the ureters, incompetence of the uretero-vesical valves, and hydronephrosis would be to complicate the subject to such a degree that not one but several evenings would be necessary for its discussion. The questions, therefore, to which I shall attempt to find an answer are these: (1) By what route do organisms reach the urinary tract in the ordinary uncomplicated case of coliform infection? (2) What are the causes that predispose a patient to infection?

The Route of Infection.

Two possible paths have here to be considered, the lymphatic and the vascular. Direct infection of the kidneys from the lower reaches of the urinary tract through the column of urine in the ureters need not be considered. Indeed it is doubtful whether this occurs even in the presence of obstructed and dilated ureters with bladder reflux and incompetent uretero-vesical valves.

It is probable that I owe the honour of opening the pathological side of this discussion to-night to the work I did some years ago on the spread of infection in the urinary tract through the lymphatics. Nevertheless I want to make it clear from the start that although I am convinced that ascending infection by the peri-ureteral lymphatics explains some of the cases of coliform infection we meet with, I believe that in the type of case to which I confine my remarks to-night the infection is more often descending than ascending.

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* One of the opening papers at a meeting of the Medical Society of London on March 24th.

However, the less common ascending infections will be considered first.

The Ascending Route.—The fact that infection may spread from the lower urinary passages to the kidney by way of the peri-ureteral chain of lymphatics has, in my opinion, been amply proved by the experimental work of Steinck, Stewart, Eisendrath and Schultz, Paladino Blandini, Thiele and Embleton, Nelson and myself. It would be superfluous to discuss the experiments on which the proof rests, for it seems to me that the point at issue is not whether organisms may spread in such a manner but rather whether this mode of infection through the peri-ureteral lymphatic is at all frequent. My own impression is that it is not.

Some of the arguments that were formerly advanced in favour of infections of the urinary tract being ascending rather than descending are certainly fallacious. The fact that many patients complain of frequent and painful micturition before they show clinical signs of renal infection is no proof that their trouble has started in the bladder. Frequency may be a symptom of an infection that is confined to the kidney, and the order in which symptoms are noted by the patient does not provide a reliable indication of the direction in which the infection has spread. As Frank Kidd has pointed out repeated cystoscopies examinations and ureteric catheterisations will show that in many of the cases that clinically appear to be examples of cystitis followed by pyelitis the invasion has in reality taken the opposite direction. In other words, the more exact our methods of investigating the patient the more commonly do we find a descending rather than an ascending infection. Nevertheless ascending infections undoubtedly occur. A striking example of this was provided for me by a medical man who consulted me in a state of alarm because he had suddenly developed a slight urethral discharge. I found that his urethritis was due to a pure *Bacillus coli* infection. At the time of examination he had no symptoms or signs pointing to trouble elsewhere than in his urethra, but within 48 hours he had developed a typical attack of generalised infection with renal pain and tenderness, dysuria, frequency, fever, and rigors.

An argument that has frequently been advanced in favour of ascending infections, and against the theory that the kidney is first attacked through the blood stream is the fact that the blood, in cases of coliform infection, is sterile. This argument cannot be dismissed as unimportant, and the suggestion that in all probability the passage of organisms from the primary focus into the blood stream is an intermittent phenomenon and that if repeated cultures were to be made positive results would more often be obtained, does not altogether explain it. It must, however, be remembered that as a general rule organisms in the blood stream are carried by the polymorphonuclear leucocytes and do not exist free in the plasma. The chance of finding them is, therefore, increased by any process that separates off the corpuscles from the plasma. Unfortunately, however, in breaking down the leucocytes may liberate bacteriolysins which destroy the organisms and render ineffective the efforts of the bacteriologist to demonstrate their presence. It is this phenomenon that is probably to a great extent responsible for our negative results.

Unfortunately at the present moment we possess no data on which to base a decision as to the relative frequency of the ascending and descending routes in coliform infections. More observations are necessary before we are justified in arriving at any conclusion, and for this reason we must avoid the temptation to settle the matter by armchair speculations.

Predisposing Causes of Infection.

So far we have considered only the infective agent and the path by which it reaches the urinary system. It must, however, be remembered that the arrival of organisms in the kidney is not enough to produce a pyelitis or pyelonephritis. Experimentally it has been shown that coliform bacilli may be injected into a vein in large numbers without any renal lesion being produced. In order that a pyelonephritis may occur the soil must be prepared. Both experimentally and clinically it has been demonstrated that obstruction to a ureter is an effective preparation, and Dr. Elizabeth Lepper has proved that complete obstruction for so short a period as a quarter of an hour is sufficient to render the kidney vulnerable. She suggests that the mechanism of this is a rise in pressure of the distended renal veins causing venous congestion and hæmorrhage into the kidney substance. In some of our clinical cases a transient and partial obstruction of the ureter may actually be the predisposing cause to the affection of the kidney, but it is difficult to believe that this is common; and we are forced to search for other factors. Our patients find for themselves a plausible explanation in "chills" and "trauma," and although we are naturally cautious in accepting these theories, it is possible that even a mild disturbance of circulation in the kidney may be sufficient to render it susceptible to the action of hostile germs. Moreover, since Helmholtz has shown that certain strains of *B. coli* show a selective affinity for the kidney, it has become less difficult to imagine that in a patient whose general resistance is low a trifling departure from the normal may be sufficient to precipitate a pyelonephritis once these germs have reached the renal tissues.

The Source of Infection.

Clinicians and experimentalists agree that the common source of infection is the bowel. This receives strong clinical support from the fact that the invasion of the urinary tract is commonly preceded by a history of some bowel upset either in the shape of an attack of diarrhœa or of an aggravation of a habitual constipation. Two other observations, for which I am indebted to Dr. D. Embleton, point in the same direction. The first of these is Dr. Embleton's observation that if different dilutions be made of the infected urine and cultured anaerobically a *Streptococcus fæcalis* is often found in addition to the more abundant and more luxuriously growing coliform bacillus. Whether this accords with the experience of any other bacteriologist I do not know.

The second observation is that if a patient who is convalescing from an attack of coliform bacilluria be given a dose of cascara, there is an immediate increase of organisms in the urine. The irritant action of the cascara on the intestinal wall is so invariably followed by a bacilluria that this purgative may be used as a provocative agent in deciding whether a patient is cured or not of his urinary infection. From this we may deduce that irritation of the bowel wall is an important factor in the production of a coliform infection of the urinary tract. That this is so was impressed on me strongly by two instances in which the injection of an anæsthetic into the large bowel in too strong a concentration was immediately followed by a coliform bacilluria. The first was provided by a rabbit in the anæsthetising of which I had employed an over-concentrated rectal injection of urethrane, the second by a patient of Dr. J. J. Clarke's who had received by the rectum a dose of paraldehyde prior to a gynæcological operation. In both instances the colitis produced by the rectal injection was followed by a severe infection of the urinary tract. Histological examination suggested that in the case of the rabbit the colon bacillus had invaded the bladder directly from the rectum.

Now although these two cases show that inflammation of the wall of the bowel permits of the emigration of leucocytes charged with coliform bacilli, they do not give any indication of the path along which these carriers of infection travel in order to reach the urinary tract. Three routes are open to them. They may pass straight into the bloodvessels of the mesentery, they may invade its lymphatics and reach the blood stream indirectly through the thoracic duct, or finally they may reach the kidney through an all lymphatic route by branching off along the large lymphatic trunk that joins the receptaculum chyli from the renal area. That organisms may travel along lymphatic vessels in an opposite direction to that normally taken by the lymph flow has been repeatedly indicated. I am convinced, therefore, that although the first two modes of infection are the more probable the third must still be considered as possible.

Morbid Anatomy.

Whilst we must confess that clinically speaking we possess no precise knowledge of the path along which infection spreads to the kidney, as morbid anatomists fortunately we find ourselves on firmer ground. The work of Helmholtz at the Mayo Clinic, and of Nelson at St. Bartholomew's Hospital, has to my mind clearly shown that lesions of the kidney produced in rabbits by the intravenous injection of organisms tend to localise themselves in the kidney substance and in the papilla, and adjacent lining of the renal pelvis, and that ascending lesions produced by bladder inoculation tend to affect the parietal wall of the renal pelvis. Post-mortem findings support the view that what is true of infection of the kidney produced experimentally in rabbits is also true of renal infection occurring in human beings. In the fulminating case of coliform infection described by Brewer and almost certainly due to a blood invasion, the septic areas were in the kidney substance, whilst in pyelitis associated with lesions of the lower urinary tract the lateral walls of the pelvis are mainly affected.

There emerges from animal experimentation yet another fact that may be applied to infections in human beings. It has been clearly demonstrated that whilst dyes and organisms are rapidly taken up by the lymphatics of the posterior urethra little or no absorption occurs when these are injected straight into the bladder. This, of course, is equally true of such drugs as cocaine, a patient being able to tolerate in the bladder a dose which were it injected into the posterior urethra would give rise to grave signs of toxæmia. From this it would appear that an ascending infection of the kidney via the lymphatics is more likely to follow a posterior urethritis than a cystitis. It is this rapid absorption of organisms from the urethra that probably accounts for the phenomenon of catheter fever, and also for the rarity of ascending infections in cases of cystitis not associated with obstructions. It also explains the coliform infections that not infrequently follow the consummation of marriage in females. Finally it helps us to understand why a residual focus in the prostate so often is the cause of relapse in the male.

There is yet another type of case of coliform infection that may be due to an invasion of the kidney through the lymphatics—namely, that which so commonly occurs as a sequel to gynæcological operations and even to labour. The close connexion between the lymphatics of the female genitalia and those of the ureter render the kidney particularly liable to invasions from this angle. But I have already published a paper on this subject in THE LANCET of 1922, and will not go into it further at the present moment. All that need be said is that although it is probable that coliform infections of the kidney are in the main blood borne, those following operations on the pelvic organs and those preceded by a posterior urethritis are more likely to be due to a spread via the lymphatics.

Conclusions.

In attempting, therefore, to find an answer to the two questions put at the beginning of this paper, the following tentative conclusions have been reached:—

1. That the kidney may be invaded in uncomplicated cases of *B. coli* infection either by the blood stream or by the lymphatics.

2. That in the majority of cases the infection is descending, but that when it occurs as a sequel to a pelvic operation or to a urethritis the invasion of the kidney is ascending and through the lymphatics. In a few exceptional cases direct invasion of the bladder from the rectum may also occur.

3. That in the absence of obstruction a lymphatic invasion of the kidney is more likely to follow a urethritis than a cystitis.

4. That the presence of the organism in the kidney is only one of the several factors that must be considered if we are to arrive at a full comprehension of the ætiology of the disease.

Bibliography.

Brewer, G. E.: Jour. Amer. Med. Assoc., 1911, lvii., 179.
Eisendrath and Schultz: Jour. Med. Research, 1917, xxxv., 295.
Embleton, D.: By private communication.
Helmholtz and Beeler: Jour. Urology, 1922, viii., 301.
Helmholtz: South Med. Jour., 1926, xix., 50; Jour. Infec. Dis., 1927, xli., 448.
Kidd, Frank: Common Infections of the Kidneys, Oxf. Univ. Press.
Lepper, E. H.: Jour. Path. and Bact., 1921, xxiv., 192.
Nelson, H. P.: Report of Luther Holden Research Scholarship.
Panton, P. N.: THE LANCET, 1912, ii., 1500.
Thiele and Embleton: Proc. Royal Soc. Med., 1913, vii., 60.
Walker, Kenneth: THE LANCET, 1922, i., 684. Jacksonian Prize R.C.S. Library.

NOTE ON A

WATER-SOLUBLE ACTIVE PRINCIPLE

ISOLATED FROM THE MAMMALIAN TESTIS AND URINE, AND ITS RELATION TO ŒSTRIN.

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IN a series of recent publications, workers in the University of Chicago (Moore and McGee, 1928; McGee, Juhn, and Domm, 1928; Gallagher, 1928, &c.[1]) have shown that certain extracts of the mammalian testis are capable of causing heterogonic growth of the head furnishings (combs and wattles) in castrated fowls. Similar results have been reported by Funk, Harrow, and Lejwa[2] (1930). The active extracts have mainly been prepared by the treatment of the tissue with volatile solvents, and an oily residue has resulted.

These observations have been confirmed by us, and through a study of the properties of the active principle it has been possible to evolve a method, which is described in this preliminary note, whereby it can be obtained in a water-soluble form.

Method of Standardisation.

All the birds used for this investigation were hatched in 1928 or 1929, and were castrated at ages varying from 3 to 78 days, and at the time of injection were from 20 to 58 weeks old. Measurements of comb size were taken periodically during the development of the birds, and for some time previous to these experiments they were made at fortnightly intervals. In the individuals used for the purposes of the present tests, the combs had either been stable for some months previous to the first injection or had increased in size at a rate not greater than that which occurs in the normal immature capon. Furthermore, in none of the capons chosen were the combs more than 5 cm. in length, since it is probable that any comb larger than this, even though stable, indicated the presence of a small testis fragment which might have complicating effects on the issue of the experiment.

With regard to the criterion of activity, it was decided to regard as active an extract causing an immediate, sharp increase in the comb length of such a magnitude as to throw the curve abruptly away from the predetermined normal. Also, this sudden increase had to be followed by a definite decrease in the comb length within a short period of terminating the injections.

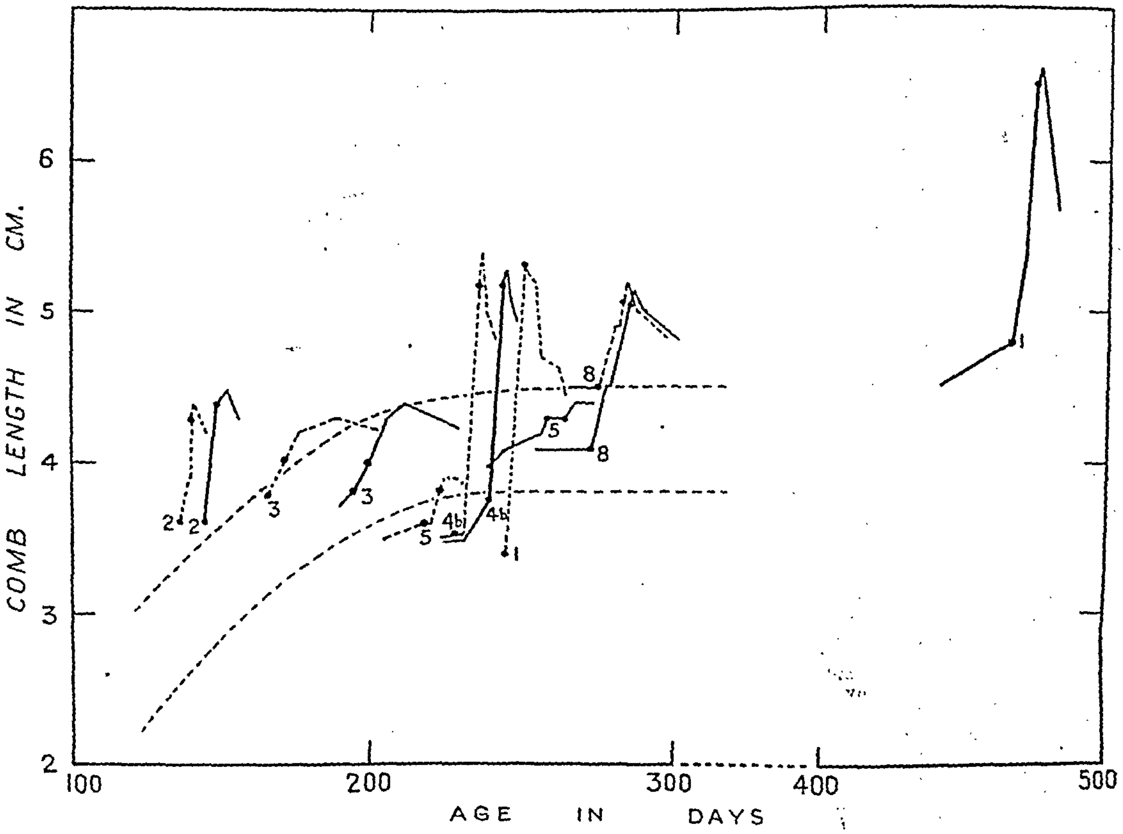

Chart showing effect of mammalian testicular extract on the combs of castrated fowls.

The growth curves for a number of normal capons for a period of from 190–300 days after hatching was found to fall within fairly narrow limits; their limit of variation is indicated in the figure by the area between the smooth curves. Though not all of the birds used in the present experiments had combs which fell between the actual limits of variation for their respective ages, yet their initial comb sizes did not deviate from the normal groups sufficiently to suggest that they were abnormal.

In order to test the potency of the various extractions, two birds were used for each product and the injections were given daily over periods varying from 5 to 12 days. The alterations in the comb length of the injected birds is shown graphically in the figure, the two dots on each curve representing the days on which the initial and final injections respectively were given. It will be seen that in the case of some of the extracts (Nos. 1, 2, 4b, and 8) a rapid growth of the comb resulted to a point much beyond that characteristic for the normal capon of similar age, and that when administration of the substance ceased this was followed by a rapid decrease in comb size. Extracts Nos. 3 and 5 were considered to be inactive.

At the present stage of the investigations it is felt that any quantitative interpretation of the results is unwarranted, and the results recorded here are intended to convey a purely qualitative idea of the activity of the various preparations.

Preparation.

The essential steps in the development of the process for isolating the growth-promoting factor are given in the following scheme of experiments. The starting-point in each case was a benzene extract prepared in accordance with the publications of the workers referred to in the beginning of this paper. The standardisation of this material is shown in curve 1 of the figure.

Crude benzene extract (1) [Active]
dissolved in ether—acetone added

Filtrate freed from solvent (2) [Active]
Precipitate [Inactive]

Saponified with sodium ethoxide (5) [Inactive]
dissolved in 50 per cent. alcohol.

Saponified with $Ba(OH)_2$
Ba removed with H_2SO_4
Centrifuged

Supernatant (4b) [Active]
Precipitate [Inactive]

If filtration be adopted in place of centrifugation for the removal of the barium sulphate in the above scheme the potency is lost (3). The final product by the above type of method consists of a water-bright solution containing some 2 mg. per c.cm. of solid contents. This is non-toxic and non-irritant when injected into animals and, as already noted, contains activity. The potency can be extracted from this water-bright solution by ether, and if slow absorption is required it can be dissolved in sesame oil.

From the above experiments the following process was reached by the direct application of barium hydroxide to the minced testes.

Process.

The final method adopted is in every way similar to that published by Allan, Dickens, Dodds, and Howitt [3] for the preparation of œstrin from placenta. The details of the process may be obtained from that publication, but the following gives a brief outline of the method.

8 kg. of minced testes are mixed with 8 litres of water and 1·6 kg. of crystalline barium hydroxide. The mixture is boiled for two hours in a steam-heated pan with a reflux condenser. The resulting mass is at once filtered through jean and is evaporated down to about 5 litres, cooled and extracted with 2 litres of butyl alcohol for half an hour in a shaking apparatus. After separation of the supernatant alcohol the solution is re-extracted with two further quantities of 1 litre of butyl alcohol for half hour each. The butyl alcohol is then removed by distillation in vacuo below 70° C., and the residue is dissolved in 600 c.cm. of hot water and, after filtration, the filtrate, residue and filter paper are extracted with three successive quantities of 600 c.cm. of ether. The ether extract is washed always with 600 c.cm. of water and the ether is then removed on the steam bath and the resulting solution is evaporated to dryness in vacuo. The remaining traces of butyl alcohol are removed by the addition of a little water and distillation. The residue is found to be highly active in producing comb growth (No. 8 in figure).

Alternatively, a purer preparation may be obtained by taking the residue from the ether by evaporation and dissolving it in about 10 c.cm. of absolute alcohol, followed by the addition of 80 c.cm. of water. The resulting suspension is boiled and 10 c.cm. of a 10 per cent. boiling solution of crystalline barium hydroxide is added. The mixture is then boiled for one hour under a reflux condenser, and after cooling a theoretical quantity of H_2SO_4 is added to precipitate the barium. The resulting mass is centrifuged and the precipitate extracted with absolute alcohol and again treated with barium hydroxide in a similar manner. The clear, pale yellow supernatant fluid is evaporated down to remove the alcohol to a convenient volume. The resulting solution is clear, almost colourless, free from alcohol, and contains the active principle (8).

The Resulting Extract.

The activity may be extracted from an alkaline aqueous solution by means of ether, and after removal of the ether the residue may be dissolved in sesame oil. Experiments are in progress to determine the relationship of the potency between aqueous solutions and oil solutions of the active principle, in a similar manner to those recorded with regard to œstrin (Allan, Dickens, and Dodds [4]).

This process may be applied to the urine of men from which the substance can be prepared. The urine is evaporated almost to dryness and the residue boiled with benzene for one hour. The benzene is distilled off in vacuo, the last traces being removed by the addition of a small amount of alcohol and then redistillation. The resulting oil may be emulsified in water and sesame oil for injection, or may be treated by the baryta process if water-soluble material be desired.

Comments.

The properties of the active principle bear a very striking resemblance to those of œstrin. Thus, both hormones can be extracted by the addition of volatile solvents and both will stand prolonged hydrolysis with barium hydroxide. They can both be obtained in a water-soluble form and the properties of the two solutions are identical.

This relationship becomes still more interesting in consequence of the claims of such workers as Laqueur and de Jongh,[5] Brouha and Simonnet [6] that œstrin may be obtained by extracting testes with volatile solvents. The effects of the comb growth promoting extract on ovariectomised rats is being studied, and whilst an œstrus effect has been observed with one preparation it is as yet too early to express an opinion upon the physiological aspect of the relationship between these two hormones.

Summary.

1. A method of testing an active substance extracted from testes and urine by observing its effect on comb growth in capons is described. 2. It is shown that the active principle may be obtained in a water-soluble form, and its chemical properties are briefly reviewed. 3. Its similarity to the œstrus-producing hormone as prepared from placenta and the urine of pregnant women is noted.

References.

1. Moore, C. R., and McGee, L. C.: Amer. Jour. Physiol., 1928, lxxxvii., 436. McGee, L. C., Juhn, M., and Domm L. V.: Ibid., 1928, lxxxvii., 406. Gallagher, T. F.: Ibid., 1928, lxxxvii., 447. Gallagher, T. F., and Koch, F. C.: Jour. Biol. Chem., 1929, lxxxiv., 495. Moore, C. R., and Gallagher, T. F.: Amer. Jour. Physiol., 1929, lxxxix., 388.
2. Funk, C., Harrow, B., and Lejwa, A.: Ibid., 1930, xcii., 440.
3. Allan, H., Dickens, F., Dodds, E. C., and Howitt, F. O.: Biochem Jour., 1928, xxii., No. 6, 1526.
4. Allan, H., Dickens, F., and Dodds, E.C.: Jour. Physiol., 1930, lxviii., 348.
5. Laqueur, E., and de Jongh, S. E.: Jour. Amer Med. Assoc., 1928, xci., 1169.
6. Brouha, L., and Simonnet, V. H.: Compt. rend. Soc. de biol., 1928, xcix., 41.

CORONARY THROMBOSIS AND COMPLETE HEART-BLOCK.

WITH A NOTE ON THE FEBRILE REACTION IN CARDIAC INFARCTION.

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Among the disorders of rhythm which may accompany cardiac infarction heart-block is frequently mentioned. While varying grades of partial block are not uncommon, complete auriculo-ventricular dissociation is a rarity. Thus in a series of 145 cases Levine and Brown [1] recorded only two instances; again Parkinson and Bedford [2] found complete heart-block only once in a series of 100 cases. Two reasons are advanced for the comparative immunity of the conducting system from the damage ensuing from coronary occlusion. First, that the interventricular septum is supplied by both the right and the left coronary arteries, and secondly that the vessels which supply the region of the auriculo-ventricular node, the bundle of His, and its two main branches are derived from the coronary arteries proximal to the usual site of obstruction.

Although the occurrence of complete heart-block is rare as a sequel of coronary thrombosis, the association of these two conditions in the converse order is still less common. The perilous state of a patient suffering from complete auriculo-ventricular dissociation and frequent Adams-Stokes attacks is sufficiently obvious; but when coronary thrombosis supervenes to add its own dangers to those already present, the condition of the patient becomes extremely grave. This sequence of events has been recently observed throughout all its phases by the writer, and will be further referred to in detail.

The ætiological significance of syphilis in the pathogenesis of heart-block has been stressed from time to time. That coronary thrombosis is essentially an acute phase superadded upon chronic arterial disease is generally accepted, and the association between heart-block and acute coronary occlusion would seem therefore to suggest that arterial degeneration is a more common factor in the production of heart-block than has hitherto been recognised. While in the instances here quoted the dissociation followed sudden restriction of the coronary blood-supply, it is likely that gradual changes in the same vessels would gradually produce the same effect, especially in elderly subjects where little or no possibility of arterial compensation exists.

Gallavardin [3] has reported his observations of two patients with complete heart-block as a result of coronary thrombosis. In the first case, block supervened five days after the onset of illness and lasted for three days at the rate of 30 per minute. In the second case sudden syncope for several seconds concluded an attack of prolonged anginal pain, and for the following four days the pulse was regular at 42 per minute. Two other cases have been described by Wearn.[4] The first patient was found to possess the new rhythm on the day following the onset of pain. The second developed a partial heart-block after a few days' illness, complete block developing subsequently. In this patient changes of rate were accompanied at first only by pauses in the pulse, but later by fainting attacks as well. Frothingham [5] records a case in which the onset of epigastric pain and collapse were related to extreme heat. On the same day an electrocardiogram demonstrated complete heart-block at 40 per minute. The rhythm gradually returned to normal and ultimate recovery followed.

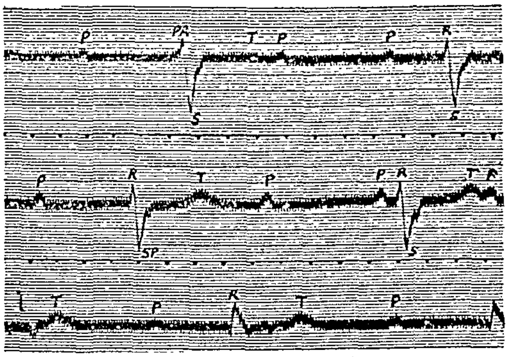
An account is given below of a patient suffering from complete heart-block with Adams-Stokes attacks, in whom coronary thrombosis supervened. Certain of the investigations made in this case seem worthy of record, in particular the charts of oral and rectal temperature. These and other aspects of the case are subsequently discussed.

Summary of Case.

The patient, a man of 59, was admitted to the Middlesex Hospital on Dec. 7th, 1929, complaining of fainting fits, breathlessness on effort, and pain in the left side of the chest.

History.—There was no significant family or personal history. In March, 1929, the patient had the first of a series of attacks in which he fell down unconscious. These seizures recurred at intervals until August when they became much more frequent, only a few days intervening between them. They were usually ushered in by dizziness, loss of consciousness for a few seconds following. Although their frequency was increasing, it was noticed that the attacks were becoming less severe. During October the patient began to experience pain in the left side of the chest and breathlessness on exertion.

FIG. 1.

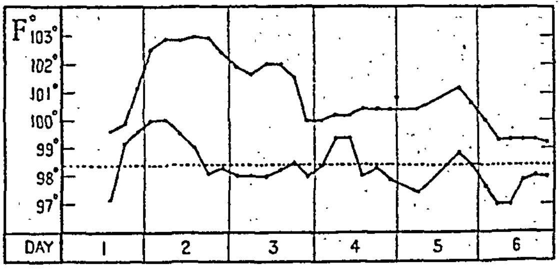


Electrocardiogram taken 20 days after the onset of coronary thrombosis in a patient previously suffering from complete heart-block. The curves show complete auriculo-ventricular dissociation with a left branch bundle block.

Examination.—The patient did not appear ill or distressed. There was no fever, nor were there any signs of congestive failure beyond a faint cyanotic tinge in the face and slight pulmonary œdema. The rhythm of the heart was regular at 30 beats per minute. The heart was not enlarged. Distant heart sounds were heard at the apex and base, but no murmurs were detected. The arteries were moderately thickened and the fundi were normal. The blood pressure was 180/75. The urine was normal. Wassermann reaction negative.

Progress.—Two days after admission the patient had eight successive slight Adams-Stokes seizures, all occurring within an hour. In these attacks there was no loss of consciousness; they were preceded by sensations of faintness, dizziness, and swaying of the body. No pulse was felt at the wrist, nor were any heart sounds heard during the five or six seconds over which each attack lasted. Although the patient was put on barium chloride, gr. ½, and subcutaneous injections of adrenalin, ♏iii., each thrice daily, two or three slight attacks occurred almost every day subsequently.

FIG. 2.



Temperature chart during the first six days after coronary thrombosis. The readings shown in the upper curve were taken in the rectum; those in the lower curve in the mouth. Note initial subnormal mouth temperature and subsequent wide disparity between oral and rectal temperatures.

Onset of coronary obstruction.—Following two days of slight dyspnœa and vague pain in the left mammary region, there was sudden onset of pain over the lower third of the sternum and epigastrium on the evening of Dec. 20th. This persisted all night and had become very severe by noon on the 21st. Examined at this time the patient was restless and rather collapsed. There was profuse sweating of the head, neck, and chest; the complexion was greyish and cyanosed, and the extremities were cool and clammy. The pulse remained slow and regular. Increasing pulmonary œdema was observed.

Two hours later fairly frequent extrasystoles were felt at the wrist. The temperature by the mouth was 97·2° F. while that in the rectum was 99·6°. Oxygen by nasal catheter was followed by some improvement in the general condition. When the patient awoke after an injection of morphia gr. ¼, the pain was very much relieved although it returned with any slight effort. A leucocyte count 40 hours after the onset of the pain showed 22,000 leucocytes per c.mm. Subsequently, frequent temperature readings were taken in the mouth and in the rectum, showing well-marked pyrexia.

Three days after the onset there were pain and tenderness and rigidity in the right upper quadrant of the abdomen. The liver was not enlarged, nor had the signs of failure increased. Frequent tests of the urine showed no albumin or sugar. During succeeding days the liability to pain on movement gradually disappeared, and fever rapidly vanished. No Adams-Stokes attacks recurred after cardiac infarction had set in.

The leucocytosis reached a maximum of 28,000 eight days after the onset of the illness; three weeks later the count had fallen to within normal limits. Three days before the beginning of the myocardial necrosis the blood pressure was 165/110. Sixteen hours after the onset of the pain, while this was still severe, the reading was 200/75, the rate being slightly increased by occasional extrasystoles. Seven days later the blood pressure reached the lowest figure recorded during the illness, 130/60. Another six weeks elapsed before the pressure had increased to 160/75.

Electrocardiograms.—In June, 1929, three months after the earliest Adams-Stokes attacks, the patient attended the National Hospital for Diseases of the Heart. An electrocardiogram taken at this time showed a normal rhythm; the T-waves were rather flattened, and there was some left ventricular preponderance.

The record shown in Fig. 1 was taken 20 days after the onset of coronary thrombosis. A normal auricular rhythm is present with a very slow independent ventricular rhythm. The form of the ventricular complexes points to a left branch bundle block. It is doubtful whether the branch bundle lesion is referable to involvement of the septum in the recent myocardial damage, or whether the combination of complete and left branch bundle block was present before acute coronary obstruction occurred.

Comments.

That the functional integrity of the conducting tissues is closely related to the adequacy of their blood-supply is demonstrated by the case described above and by others to which reference has been made. It might be expected that if permanent occlusion of one of the coronary vessels may result in permanent heart-block, transient ischæmia as occurs in angina might temporarily produce such a block. This, in fact, occurs. Gallavardin[3] has described a syncopal form of angina in which slowing of the pulse occurred during the attack, but in which this slowing could not be definitely established, as the normal rate was resumed at the end of the attack. Again, Huchard[6] has given an account of a patient who suffered from typical attacks of angina pectoris which were accompanied by vertigo and sometimes syncope. In one very severe attack the pulse slowed to 28 over a period of ten days, and later fell to 24.

Embolism of the coronary arteries has been described by Gallavardin and Dufourt,[7] who observed this unusual event in a patient of 63 who suffered from hypertension and cardiac enlargement with gallop rhythm. Severe epigastric and præcordial pain set in with progressive collapse and rapid death. During this final illness the pulse slowed to 28 and 22, and at autopsy an embolus was found in the left coronary artery at its bifurcation into circumflex and anterior descending branches. Three similar cases are cited by the same authors, the obstruction in each instance being at or very close to the bifurcation of the left coronary artery. The more proximal position of the occlusion in embolism as compared with that in thrombosis must explain the greater liability to heart-block in the former condition.

Febrile Reaction.

The febrile accompaniments of cardiac infarction are too well known to need any reiteration. The case just described illustrates these phenomena. Levine and Brown[1] have remarked that a patient during the onset of coronary thrombosis may have well-marked fever in an observation taken per rectum, while the mouth temperature is still subnormal. In the present case this difference was well shown, and four-hourly temperatures taken both orally and rectally were charted. These curves are reproduced in Fig. 2 and show a very pronounced disparity lasting over four days. While the mouth temperature was still subnormal that in the rectum was higher by 2·4° F.; within 32 hours of the beginning of the attack a difference of 2·8° F. was recorded, and when during the next 12 hours the mouth temperature fell to 98° F., the disparity was 4·8° F.

The explanation of these febrile phenomena is probably to be found in the combination of an acute inflammatory process and a state of collapse with sweating over the head, neck, and chest. The cooling of the periphery is exaggerated in the upper part of the body by heat-loss from evaporation. Conversely, within the pelvis, where heat-loss is reduced to a minimum, the febrile reaction due to acute necrosis in the myocardium is able to declare itself.

My thanks are due to Dr. C. E. Lakin for permission to use the notes and records of the case described; to Dr. G. E. S. Ward for the electrocardiographic report; to Prof. J. McIntosh for the leucocyte counts made in the Bland-Sutton Institute of Pathology; and to Dr. R. O. Moon for supplying information concerning the patient during his attendance at the National Hospital for Diseases of the Heart.

References.

1. Levine, S. A., and Brown, C. L.: Medicine, 1929, viii., 246.
2. Parkinson, J., and Bedford, D. E.: THE LANCET, 1928, i., 4.
3. Gallavardin, L.: Présse Méd., Sept. 2nd, 1922.
4. Wearn, J. T.: Amer. Jour. Med. Sci., 1923, clxv., 250.
5. Frothingham, C.: Med. Clin. of North Amer., 1927, x., 1357.
6. Huchard, H.: Traité Clinique des Maladies du Cœur et de l'Aorte, third ed., 1899, i., 402.
7. Gallavardin, L., and Dufourt, P.: Lyon Méd., July 27th, 1913, p. 57.

Clinical and Laboratory Notes.

A PLATINUM RESISTANCE THERMOMETER

FOR MEASURING THE TEMPERATURE OF THE SKIN.

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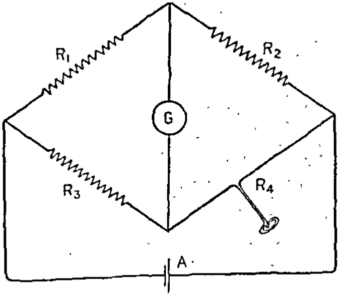
I HAVE devised a method for the measurement of skin temperatures by means of the platinum resistance thermometer which, I believe, is in several respects preferable to the more usual thermo-electric method, as described by Benedict[1] and others. The method has the following advantages: (*a*) the apparatus is portable, being contained in a case measuring 9 by 9 inches by 6 inches in depth; (*b*) the thermometer is robust, and may be applied by an unskilled operator; (c) the galvanometer is direct, reading in degrees Centigrade or Fahrenheit. The essential parts of the apparatus are shown diagrammatically in the figure.



A = Two-volt dry cell. R_1, R_2, R_3 = Resistances, each of 50 ohms. R = Resistance thermometer. G = Unipivot micro-ammeter graduated in degrees.

The thermometer itself consists of a flat spiral of insulated platinum wire (No. 48 gauze) cemented to the end of an ebonite rod, and held in place by a thin film of celluloid varnish; the diameter of the disc applied to the skin is about 8 mm. With regard to the galvanometer, a micro-ammeter of the unipivot type is sufficiently sensitive. The thermometer, as will be seen, forms one arm of a Wheatstone bridge; a thermostat, therefore, is not required.

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[1] Benedict, F. G.: Leopoldina (Amerikaband), 1927, iv., 129.

In making a measurement, it is necessary to bring the thermometer to a temperature as close as possible to the temperature of that part of the skin which is to be measured; this is conveniently done by holding the surface of the thermometer in the palm of the operator's hand for half a minute. The current to the bridge is then switched on; when the galvanometer needle has become steady, the thermometer is applied to the skin. A reading, accurate to 0·05° C., may be obtained within 3–6 seconds.

The apparatus may be obtained from Messrs. Griffin and Tatlock, Ltd., Kingsway, W.C. 2.

A CASE OF CARCINOMA OF BRONCHUS.

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A WOMAN, aged 27, had a small hæmoptysis on Oct. 17th, 1929. This was followed by a slight irritating cough but otherwise there were no symptoms and she had previously been in good health. The cough continued and radiological examination in December showed a dense opacity in the middle third of the left lung. The shadow was continuous with the hilum and had a well-defined lobular margin; it did not extend into the apex of the lung.

Artificial pneumothorax was induced for diagnostic purposes and the mass was found to be intrapulmonary. Operation was performed on Jan. 8th, 1930, by Mr. Tudor Edwards. The lung was incised and a mass the size of a walnut was found in a bronchus. The bronchial wall was much stretched and thin so that it appeared as a capsule, but the growth could be shelled away except one portion where it appeared to be growing by a pedicle. It was successfully removed and the bronchus was ligatured. On section the growth was found to be carcinoma. The patient made an uninterrupted recovery and has now left hospital.

This case is similar to two cases[1] in which small pedicled growths were removed through a bronchoscope; in both these cases, however, the tumours were fibromata and non-malignant. In the present case the growth appears to have started as a small pedicled tumour and not in the usual form of bronchial carcinoma invading the bronchial wall. It is interesting to note that a considerable portion of the shadow seen by X rays was due to collapsed lung beyond the tumour, and it should be remembered that a large X ray shadow does not of necessity mean that the growth is large or inoperable.

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[1] THE LANCET, 1927, ii., 1180; and 1929, ii., 708.

PROGRESS OF CONTRIBUTORY SCHEMES.—Of the total income—£124,151—of the Merseyside Hospitals Council £108,253 was contributed by the Penny-in-the-Pound Scheme (227,626 members), which was more than was budgeted for from all sources. The income in 1929 was nearly double that of 1928. A contributory scheme for people of moderate means is being prepared.—Last year approximately £31,000 was raised by the Workers' Contributory Scheme in connexion with the East Suffolk and Ipswich Hospital; rather more than one-half of the money was subscribed in Ipswich and its environs. The subscription is 3*d*. per week. Sixty per cent. of the hospital's income is derived from this source.—At the second annual meeting on March 13th of the Merseyside Association of Hospital Contributors (Penny-in-the-Pound Fund), it was reported that during the year the fund raised £122,940. Of this, £92,000 was passed on to the Voluntary Hospitals and Radium Fund, £24,698 paid to poor-law and unassociated hospitals, and £3119 spent on convalescent and after-care services. It was decided that the Merseyside area should comprise districts within a radius of ten miles of Liverpool Town Hall.

Medical Societies.

MEDICAL SOCIETY OF LONDON.

AT a meeting of this Society held on March 24th the chair was taken by Mr. DONALD ARMOUR, the President, and a discussion on

COLIFORM INFECTIONS OF THE GENITO-URINARY TRACT

was opened by Sir THOMAS HORDER. He excluded gross disease processes, such as infection complicating enlarged or malignant prostate, renal and vesical calculus and neoplasm, tuberculosis, stricture of the urethra, and infection following instrumental examination, but pointed out that these must be considered before any case was regarded as a primary infection. The avenue of invasion, he said, was notoriously dubious. The proof of a hæmatogenous route was slender and the sudden onset often quoted in its favour might be seen in catheter cases. Analogies with staphylococcal renal infections were dangerous, and the rare positive blood culture was not admissible as certain proof. It was always possible that the blood infection might be subsequent rather than precedent to the urinary infection. The lymphatic route was equally difficult to prove or deny. Highly suggestive facts were the proximity of the colon to the renal pelvis, the special tendency of the right kidney to infection, and its liability during pregnancy. An alternative lymphatic route was along the course of the ureter. It was unwise to conclude too hastily that the ascending route was not followed in some at least of the cases where the maximum intensity of infection was in the renal pelvis. The pelvis was the most susceptible part of the urinary tract, and even when the onset strongly suggested a pyelitic origin the bacillus might also be present in other parts of the tract. In some cases the prostate might be the tissue through which infection reached the tract, even in the absence of disease or enlargement. Some patients had severe dysuria and passed blood and pus in the initial stages with no clinical suggestion of pyelitis. It seemed certain that the prostate might be a source of reinfection. The fairly frequent association of disease in the alimentary tract with urinary infection was occasionally overstressed, but this was better than neglecting it; the alimentary defect might be a subinfection or an anatomical lesion or both. Proof of the presence of a coliform infection was very difficult if not impossible at present. The organic lesions actually found included diverticulitis, sepsis of the gall-bladder, appendicular disease—especially chronic infection accompanying mechanical disabilities—ulceration of the colon, and the grosser forms of enteroptosis. The association of constipation was almost universally accepted but very hard to prove. It was so common that many patients suffering from coliform infections of the urinary tract were bound to be constipated. The fact remained, however, that therapeutically it was useful to correct colon stasis. Some cases originated during or just after a period of looseness, but these should probably be interpreted as instances of bowel infection complicated by urinary infection. It was probably wisest to attach significance to the bowel subinfection rather than to the constipation. Important minor anatomical defects included piles and anal fissure.

The disease had many vagaries; it occurred at all ages, and varied in intensity from a mild pyrexia to stranguary with the passage of blood and pus. It might show itself as hæmaturia alone, or a complication like epididymitis might be the first thing that brought the patient under observation, or his condition might be diagnosed for years as "recurring influenza." Relapses were very common indeed. He visualised every transition in intensity from bacilluria, causing pyrexia and general toxic symptoms, and the most severe infection, leading to pyelonephritis or extensive ulceration of the bladder. Most cases fell between these two extremes.

Treatment.

Here, as elsewhere, the fullest diagnosis must be made. The infecting agent must be known, but very often an organism that was bacteriologically "pathogenic" caused milder symptoms than one which was classified as *Bacillus coli communis*. The less readily the case yielded to general treatment the more cautious must the practitioner be in accepting it as a primary case, but it was difficult to decide what investigations of the urinary tract should be made. Sir Thomas Horder did not consider that a full routine examination in all cases was in the patient's best interests, and deferred cystoscopic examination until after a complete general treatment had been tried in patients who offered no clinical or radiological evidence of renal enlargement or gross disorder of the ureter and bladder.

X rays were useful in reviewing the alimentary tract. The good results of adjusting a defect in the bowel was sometimes very striking. Often enough, however, the most careful search failed to show any recognisable lesion. As he regarded the troubles of enteroptosis as due to circulatory and neuromuscular defects he did not advise colon-pexy, but introduced into the scheme of treatment such measures as corsets, massage, breathing exercises, and the semi-Trendelenburg position. That constipation should be dealt with effectively was agreed, though methods varied. The denudation of the mucous membrane, which was the physical mechanism by which aperients acted, could only be expected to encourage the auto-infection by which urinary infection was supposed to take place. "Changing the intestinal flora" sounded attractive, but how to accomplish it and the results of doing so were still unknown. Diet played an important part in the treatment of some at least of the cases; the protein should be reduced considerably, and game, eggs, and raw milk forbidden. Whey, butter-milk, cream, and even junket could be allowed; it seemed to be the casein residue that was harmful. This was admittedly empirical, but seemed to have good results.

A good number of these patients were neurasthenic; the corresponding condition in the child was perhaps precocity, often in an only and spoilt child. The adult frequently had a low blood pressure. The disease was much more common in private than in hospital practice and in professional than in business life, and was common in doctors. It might possibly be connected with irregular habits, hurried meals, lack of adequate rest, or exposure to infection; at any rate to combat these factors was part of the treatment. Of chemical remedies two stood out prominently: the simple alkalis and the hexamine group, the former in the pyrexial cases and the latter in subacute and post-febrile stages and in chronic cases. So successful was alkalisation that its failure should throw doubt on the diagnosis, and suggest the presence of some other factor. To a lesser extent the same was true of hexamine. To ensure the acidity of the urine, acid sodium phosphate was prescribed concurrently but separately—e.g., after food when the hexamine was given before food. In intractable cases it was a good thing to vary the form of the hexamine, as sometimes one kind seemed to work better than another. Intravenous agents such as mercurochrome had been tried, but without striking results. The method should, however, be used in those rare cases in which anuria or vomiting was present. Antigen therapy had not lived up to its original promise, but was worth trying in difficult cases. Some immunologists gave large initial doses, aiming at a reaction, but Sir Thomas Horder aimed at an amount just short of a reactive dose, believing the process to be an educational rather than a disciplinary one. Lavage was notoriously good for inflammation localised to the bladder, but irrigation of the renal pelvis was irrational and had not proved satisfactory. Direct surgical interference with the kidney had now been abandoned.

Mr. KENNETH WALKER then read the paper which appears on p. 681.

Experiments on Animals.

Dr. H. P. NELSON claimed that the pathological picture produced in the kidneys by an ascending infection differed essentially from that produced by a hæmatogenous infection, and described experiments that he had performed on rabbits. When he introduced about two thousand million colon bacilli into the bladder, after this had been prepared by pure turpentine, the blood infections were so transient, while the kidneys showed gross abscesses, that he was convinced that the blood infection was the result and not the cause of the spread to the upper urinary tract. The blood remained sterile in animals which had no kidney lesion, and he thought that the kidney and blood alike were infected through the ureteral lymphatics. Trauma was the deciding factor—apart from virulence of the organism and resistance of the host—in deciding whether an animal got its lymphatics infected or not. He suggested that the organisms entered the lymphatics through the urethral mucous membrane and not through the bladder. Rabbits which had received intravenous injections of colon bacilli might have their blood swarming with organisms and yet none could be found in the urine. Pyelitis was predominately a disease of the female rather than the male infant. The female urethra was buried at the bottom of a moist cleft and the napkin of the baby suffering from diarrhœa became saturated with virulent colon bacilli. It had been shown experimentally that bacilli from the urethra reached the kidney in an hour and a quarter, and it seemed unnecessary to blame the infant's colon. The argument against ascending infections was the absence of cystitis, but urethritis had not been excluded. The passage of organisms from the colon to the kidney had not been supported by experimental work; the kidney might be surrounded by a virulent abscess without getting infected. When the organisms were introduced into the bladder the lesions at post-mortem were cystitis of varying severity and abscess on the parietal wall of the renal pelvis, with hypertrophy and hyperplasia of the neighbouring mucosa. When the organisms were injected intravenously the lesions always consisted of inflammatory streaks in the papilla, which proved microscopically to consist of peritubular collections of polymorphonuclear leucocytes.

Discussion.

Mr. J. P. LOCKHART-MUMMERY agreed with Sir Thomas Horder that the most usual route, generally speaking, was the mucous membrane of the urethra, the reason probably being the unfortunate proximity of the urethral opening to the anus. He believed that most cases were due to primary infection from the large bowel. One of the conditions most frequently incriminated was hæmorrhoids; he thought that infection could only be conveyed from piles by the blood stream or the lymphatics if the surface were broken, and that it was never propagated by uncomplicated piles. A very common source was a fissure or fistula, which was often unsuspected and the treatment of which would generally cure the condition. He had never met with a case of diverticulitis unaccompanied by a marked coliform infection of the urinary tract; the route was difficult to determine but was, he thought, usually the lymphatics of the ureter.

Dr. T. JOEKES pleaded for a more extended trial of treatment by the bacteriophage of d'Herelle. One of the chief difficulties was the very narrow specificity of this series of organisms. He described his methods of cultivation in broth, the only successful medium. If bacteriophage was already present in the stools, as shown by its effect on the actual infective organism, a culture was made from the second filtrate and passaged very many times until it became virulent. If left too long in contact with the organism, tolerance was established. It was essential that the urine be made alkaline for this treatment. Cases of seven or eight years' standing had been cured.

Sir **THOMAS HORDER**, in reply, regretted the commercialisation of the bacteriophage in France, and welcomed the attempt of a British pathologist to explore its possibilities. He mentioned Besredka's method of applying an antigen to the intestinal mucous membrane for dysenteric conditions; if only a part of what the French workers had claimed for it was true it should be worth trying on the urinary tract, particularly in vesical infections.

Mr. **WALKER** also replied.

HUNTERIAN SOCIETY.

ATHLETICS IN SCHOOLS.

AT a meeting of this Society held on March 24th, with Dr. **ERNEST YOUNG**, the President, in the chair, Dr. **L. R. LEMPRIERE** opened a discussion on Athletics in Schools; his paper is published in full on p. 679.

Dr. **A. I. SIMEY**, whose experience was based on nearly twenty-two years' work as school medical officer at Rugby, did not intend his remarks to apply to Rugby in particular. Boys at public schools, between the ages of 13½ and 18½, were passing through the critical stage of adolescence. The range of games played was a wide one, especially during the winter terms, and to these were added the exercise demanded by the officers training corps and physical training classes. Inter-school matches and competition between the various houses threw a considerable nervous strain on the boys and added to the difficulties of the doctor. The aim should be to preserve fitness of mind as well as body. Schools should be judged neither on the number of blues and internationals they could produce, nor on the number of their university scholarships; education was not measured by either of these standards. A healthy body did not necessarily imply an athletic body. The word "athlete" was derived from the Greek word meaning "a contest"; the corresponding adjective had the meaning "struggling, unhappy, wretched, and miserable." Our present system of school games was over-organised and pushed too far. Boys were taught to play everything in the correct manner, so that they undertook athletics for athletics sake rather than for the sake of body and mind. Spontaneity in recreation was essential; the most graceful games that could be observed were the unpremeditated acts of young cats and dogs rather than the behaviour of trained and bridled horses. The fact that the standard of football had risen in a school did not necessarily mean that it would produce better citizens. At present there was a perpetual egging on of boys to perform athletic feats in hours which might be devoted to some other form of recreation. When a boy was heard to express pleasure at being "excused games" it was a sign that he was overdriven. Most boys were delighted when a "non-compulsory changing day" was established; those interested in the arts or music had an opportunity to pursue their taste, and it was important that their development in these branches should not suffer. From the establishment of the Greek games in 776 B.C. to their abolition by Theodosius in A.D. 392, there was no evidence that the athletes underwent any prolonged training before the games.

Dr. **HELEN BOYLE** said that she also had sought the derivation of "athlete" but evidently in a different book, since the references to misery were omitted. Having its origin in "contention" athleticism now referred to all games. She had noted with interest that Greek boxers developed their muscles by delving in the earth, and regretted that this use for boxers had now lapsed. In England athletic competitions were begun at Sandhurst in 1812; in 1840 Rugby, Eton, and Harrow followed suit, and the first contest between Oxford and Cambridge took place in 1864. It was doubtful whether we had improved markedly as a race since the introduction of these sports. Athletics were essential to our present school system, but was it certain that the present system was the most desirable one? It was not for nothing that "mens sana" came first in the tag; it should not be forgotten that it was possible to have a healthy body with an unhealthy mind, nor that great mental capacity can coexist with considerable bodily infirmity. Every generation differed from the preceding one, and continual reconstruction was necessary to fit education to new needs. Civilisation was the art of living together, and education should be as fluid as life. Athletics were valuable in that they pictured the conflicts coming later in life. A famous head-mistress once said: "If you can come out for a duck and not look a fool you have done something." Games should teach a child how to be a fool and not look it. They also introduced unselfishness, with pleasant associations of the herd spirit and the approval of the herd. But at present there was not room for every type of personality to develop. A dislike for games was not a sign of depravity; they might sometimes hamper a child who was better free. The main use of a healthy body was the capacity of its owner to work, and one of the severest tests of health was work in confined ill-ventilated quarters without opportunities for exercise. The too eager cult of games led to a belief on the part of the child that anything useful or productive was not recreation—a poor psychological start in life. We must ask ourselves whether the present system produced the best citizens.

Administration of School Games.

Mr. **H. M. ABRAHAMS** said that the difficulty of the present system lay not with the games but with their administration. Physical interference in games was the fault of the masters, and the danger to the athletic boy was not of an enlarged heart but an enlarged head. Too much emphasis was laid on cups and trophies and too little on the effort which should be put into games irrespective of results. Boys should be taught the rudimentary principles of sports at school, so that they might develop later. The stop-watch and tape-measure should be abolished, and the position of games should not be out of proportion to their importance. Competition should be rare, and as many persons possible should be involved in all contests. Not less, but more attention was needed, so that all might learn the proper use of limbs and the rudiments of style.

Dr. **ADOLPHE ABRAHAMS** referred to the commonness of albuminuria in athletic subjects during adolescence and its rareness in the seasoned athlete. He went on to say that athletic schoolboys seldom materialised into famous athletes later; this was usually put down to "strained heart," but in reality no such condition existed. The schoolboy's heart was as elastic as his stomach. The period of deterioration or stagnation could be weathered if the boy were sufficiently determined, but comparatively few cared to make the effort. Compulsory games were an invention of the devil and should be abolished. Running was the normal form of exercise, and boys should be taught to run; after that they could play what games they pleased with a fair chance of success.

Effects of Training.

Group-Captain **MARTIN FLACK** said that he had examined many hundreds of boys between the ages of 17½ and 18½ for the Royal Air Force. Public school boys made good pilots because they had led an open-air life, they had learned to play the game, and they had never done sufficient work to ruin their eyesight. The value of athletics in schools was to overcome the disadvantages of the upright posture, which placed the main supply of our blood below the pump. Games should tend to strengthen the abdominal muscles, and to assist the flow of blood back to the heart, and therefore those games were most valuable which introduced the greatest amount of contortional ability, provided always that the duration of the exertion was not too long. Respiration should involve the full use of the lower ribs, not of the upper chest merely. The proper results of training could be exemplified by an individual case:—

> A recruit at his first examination had a pulse rate of 84; on rising slowly to his feet over a period of three seconds, the rate went up to 96 and returned quickly to 84; after standing five times on a chair it rose to 180; and fell to normal in 35 seconds. After two months' training the pulse rate was 72; on standing it rose to 84 and fell quickly to 72; on exercise it went up to 96 and returned to normal in 15 seconds; the blood pressure was: Systolic 126, diastolic 84. The heart was pumping a bigger load per beat and the diastolic pressure had risen. The vital capacity had increased by 280 c.cm.

Instability of the vaso-motor system, whether due to adolescence or other causes, was manifested by a delayed return to the normal pulse rate after exercise. As a result of such training the disadvantages of the upright position might be overcome. Before games were taught in schools boys should be trained to breathe.

Dr. CAMPBELL MCCLURE described the two groups into which boys fell: those who were muscular and stocky in build, and those with a long thorax and abdomen and an upright heart. The muscular type was liable to be overtrained at school, and the other type was often unsuccessful at games. Athletics were over-emphasised at schools; it should be remembered how few of our children earn their living by their legs.

Dr. GUSTAVE MONOD said that in France there were no compulsory games; the chief concern of the masters, who were legally responsible for injuries to their pupils, was to persuade them to play peaceably at marbles and to avoid the dangerous sport of running. He thought the English system fairly good, but it was a regrettable fact that he saw many veteran athletes at Vichy in search of a cure for adiposity. Centenarians, on the other hand, generally appeared to live in confined rooms, to profess a marked distaste for fresh air, and to smoke and drink heartily.

Mr. MARTIN ALDERSHAW proposed a vote of thanks, which was seconded by Dr. Currie.

ROYAL SOCIETY OF MEDICINE.

COMBINED SECTIONS OF DERMATOLOGY AND MEDICINE.

THERAPEUTIC VALUE OF GOLD COMPOUNDS.

AT a combined meeting of these Sections on March 20th Dr. S. ERNEST DORE, who presided, remarked that the subject presented some difficulties. For example, the ætiology of lupus erythematosus was uncertain; some regarded it as a tuberculous affection, others as belonging to the tuberculous group, still others as due to a streptococcal toxin arising from a focus in a distant part of the body. In this disease it was, he presumed, only those cases in which the tuberculous ætiology was not in doubt that were treated with gold compounds; and even then there seemed to be differences of opinion as to their value. Some regarded them as being as specific in lupus erythematosus as were arsenobenzol preparations in syphilis; on the other hand it had been stated that these gold compounds were so toxic as to be unsuitable for routine use. Some thought they gave rise to fibrosis and were beneficial on that account.

Prof. S. LYLE CUMMINS said he would not deal with dermatological conditions, although experience with these drugs in medical practice might have a definite bearing on dermatological practice. Most new preparations opened with a phase of great hope, followed by oblivion; but the gold compounds met with discouragement from the start, and only careful animal experimentation and very gradual human use had brought them through that era of doubt into a position of practical medicine. There could now be no doubt that gold was a chemical substance which exerted a selective action on tuberculous lesions, and was therefore of therapeutic value in tuberculosis. In his own hands it had given satisfactory results in all the patients on whom he had tried it. It was true they relapsed afterwards; the drug could not be regarded as a cure. It was important to obtain a clear idea of its mode of action; otherwise treatment would remain empirical. Mollgaard found that sanocrysin had an effect on the tuberculous as different from its action in the healthy, as Koch had found to be the case with his tuberculin. The action, which seemed to be on tuberculous foci rather than upon the bacilli themselves, was catalytic—i.e., it speeded up processes of cure which had before been going on slowly. When gold was given skilfully in suitable cases patients tended to improve in regard to temperature, weight, and general condition, with a decrease in sputum, and the number of bacilli excreted; in fact the sputum might dry up for the time being. The success of treatment seemed to depend on the degree to which the patient was able to neutralise or tolerate the toxic substances set free in the circulation as a result of focal hyperæmia. Hence the individual dose given must vary according to the phase of the disease. Always acting within the limits of the *dosis tolerata* (the dose which could be given to a healthy person without risk of metallic poisoning) the selection of the proper dose for the patient depended on the laws regulating vaccine therapy rather than on those applicable to drugs without a chemotherapeutic action. With the advent of heavy metal therapy in tuberculosis, it was essential to have a method of assessing cases. Among the surest guides were temperature, body-weight, the amount, character, and bacillary content of the sputum. Promising lines of work were the blood changes in tuberculosis and a better appreciation of tuberculin sensitivity. The main lessons he had learned from his animal experiments was that the disease must have become localised into a lesion for the gold to have a definite action.

Discussion.

Dr. A. C. ROXBURGH and Dr. H. CORSI presented the results of their experiences with these drugs at St. Bartholomew's Hospital. Krysolgan, they said, had a gold content of approximately 50 per cent. by weight, and the dosage varied between 0·0015 and 1·5 g. The dose of sanocrysin which had a gold content of 40 per cent. was 0·05 – 0·25 g. intravenously. In the series of cases related no local treatment was used except calamine lotion. Krysolgan was said to kill tubercle bacilli in dilutions of 1 in 100,000, and to inhibit their growth in a strength of 1 in a million; 29 g. had been used spread over 43 injections extending over 20 months. Most of the cases of lupus erythematosis treated had been of the chronic fixed type. The longest duration of the disease before gold treatment commenced was 20 years, the shortest period was one month, the average period being seven years. In one series, 19 females and 16 males were treated, and the ages ranged from 18 to 61. In all, 35 cases of lupus erythematosus were treated with gold, four cases of Bazin's disease, one of papulo-necrotic tuberculide, one of erythrocyanosis frigida, and one of pityriasis lichenoides varioliformis acuta. Of the 35 cases of lupus erythematosus, 23 were either cured or very much improved, while two were slightly improved, in five there was no change, and five were worse after the injections. Six among eight of these cases which had been regarded as cured relapsed in a few months. In 12 lupus erythematosus cases the Mantoux test was positive in nine, negative in three. Toxic reactions followed 6 per cent. of the injections, but none of these lasted long nor were they serious in nature. There seemed little to choose, Dr. Corsi said, between the two drugs, though perhaps sanocrysin was somewhat the better, as it could be given in larger doses without risk. It could not be said that the gold compounds were a cure for lupus erythematosus, but it was a great advance to be able even to improve cases of such a stubborn condition as this.

Dr. C. J. **Marshall** said he had used sanocrysin since it was first advocated, and he had seen the earlier cases treated in this way in Copenhagen. He was struck by the different reaction obtained according to the length of time that the patient had been suffering from the infection. His experience supported that of Prof. Cummins in his animal experiments—namely, that good results ensued when a definite time had elapsed between the original infection and the beginning of the treatment. When first introduced sanocrysin was used for all kinds of cases, and the speaker saw some disastrous results. His practice now was to delay the use of sanocrysin for a year from the commencement of symptoms. Dr. Marshall thought it would be a mistake to be afraid to give sanocrysin because the patient was febrile when at rest; he had had good results from it in such cases. He would not claim to have cured any patient of pulmonary tuberculosis by gold injections; he had had many cases in which the symptoms had ceased after courses of the treatment, but they relapsed, and relapse took place quicker than after constitutional treatment. But preparations of gold had proved of value in getting patients fit to undergo constitutional treatment.

Dr. H. W. **Barber** said he had treated a large number of cases of lupus erythematosus in the last few years with gold compounds, commencing with krysolgan, going on to sanocrysin, and later to solgarnol, the latter being considered less toxic and more efficacious than the other two. Though it was his custom to commence with small doses, and increase them cautiously, it was worth while, when dealing with a resistant patient, to give a "knock-out" dose, always provided no lung tuberculosis could be detected. Some of his tuberculide cases had done well under the gold treatment, but he could not claim that it had cured any of them. He had seen more toxic reactions after sanocrysin than after the other preparations. After solgarnol he had seen a generalised lichenoid rash in a patient with pulmonary tuberculosis who was brought to him because of the rash. Summing up his experience, he said the gold treatment of lupus erythematosus was satisfactory up to a point; some of his cases had remained quite well after it for two or three years, but many had relapsed.

Dr. J. E. M. **Wigley** said his experience of the gold treatment for skin diseases was entirely limited to sanocrysin, and the only disease he had treated in this way was lupus erythematosus. Of 21 cases so dealt with, only one was unaffected by the treatment; none was made worse by it. In some of the improved cases, however, the effect was only temporary He described several cases.

Dr. H. **MacCormac** said it was a pity some principles could not be formulated in regard to lupus erythematosus on the same basis as those of Prof. Cummins had in regard to general tuberculosis; it was difficult to decide whether these lupus cases were tuberculous or not. There was a big difference between lung lesions and skin lesions; in the latter, being on the surface, half the possible reacting area was cut off, and that was one reason why the dermatologist had difficulty in securing results. He had tried sanocrysin in two or three cases of lupus vulgaris, and in a recent paper Dr. Haldin Davis spoke highly of these injections for that disease. In the speaker's cases of lupus vulgaris there was definite improvement after the injections, but nothing like to the same extent as in lupus erythematosus. He regarded gold compounds as a valuable part of treatment, as they achieved improvement in cases which were resistant to every other form of application.

Dr. W. N. **Goldsmith** said he had treated by means of some gold preparation every case of lupus erythematosus which had come to him since 1925. The vast majority had reacted well, some apparently remaining cured over a period of three years. Most of them had relapsed, but they again benefited when the treatment was resumed. On account of reports of its toxic effects he had not used sanocrysin much, preferring krysolgan, triphal, orophos, and lutean. He had tried metallic colloidal gold and found it had no effect whatever. The dosage was puzzling; he had generally used tiny doses. With triphal he seldom exceeded 1·5 g., the quantity given being graded by the patient's response. Most of the cases did well, apparently in spite of the absence of a clinical focal reaction. Triphal was the most rapid in its effect and the only toxic effect he had seen was a little malaise. If a patient had a focal reaction, the speaker stopped the drug. As yet there was no guidance as to how long the treatment should be continued with the view of preventing relapses.

Reply.

Prof. **Cummins** said that the patients referred to by Dr. Goldsmith as having no definite lesion would probably be found to have small hyperæmic areas.

Dr. **Corsi** said that no knock-out doses were given in the cases dealt with in the paper he read, and even then there were a good many symptoms. The dosage used by Dr. Roxburgh and himself never exceeded 0·25 g. Möllgaard had stated that it was not the gold ion which was circulating, but a complicated ion, AuS_2O_3; it was this which had the power of diffusing through the avascular tissue which surrounded the tuberculous follicle. Possibly a pure gold ion would not have the same penetrating capacity.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.

At a meeting held on Feb. 25th at B.M.A. House, Miss **Frances Huxley** being in the chair, Dr. **Françillon Lobre** spoke on the

Radiography in Sterility.

She said that the method of tubal insufflation, widely employed in the United States, was much less exact than was the radiographic method. It merely showed whether the tubes were, or were not permeable, while examination with lipiodol not only showed an obstruction impairing tubal permeability, but revealed its situation, which was a point of capital importance if reparative surgery were contemplated. The radiographic method also supplied information concerning the exact position of the uterus, its form, and the aspect of the tubal and uterine cavities. It likewise showed the condition of the mucosa and its reactions to lipiodol. These were valuable therapeutic indications for the treatment of sterility, since they show the importance of uterine and tubal spasm in a large number of the cases thus examined.

Lipiodol, she said, was well tolerated by the tubes. Rubin had described some cases in which the radiographic method was followed by peritoneal reactions, but it was possible that the cases of infection recorded had followed the use of a liquid other than lipiodol. Laparotomies had been performed upon women who had received injections of lipiodol 48 hours previously, and no sign of peritoneal inflammation had been encountered. In certain cases where mistakes in technique had permitted injections to be made under too high pressure, small collections of oil had been found in the connective tissues, but no sign of inflammation. It was necessary to keep the pressure under strict control, but with lipiodol the pressure employed might be higher (up to 30 cm. of mercury) than was permissible when air was insufflated (up to 23 cm. of mercury). Gases which were easily compressible might induce a pressure at the point of resistance higher than that at the point of escape, and it was therefore logical not to exceed an initial pressure of 23 cm. for insufflation, in spite of the fact that a much higher pressure was required to produce experimental tubal rupture. In collaboration with Dr. Jean Dalsace, Dr. Lobre had examined 230 women for sterility during the last three years. The cases examined were those in which a preliminary examination of the husband had eliminated the male factor, and in which careful clinical examination of the woman had proved negative. Contra-indications to radiographic examination were the presence of active lesions, such as those accompanying metritis, salpingitis, appendicitis, or metrorrhagia. The best time for the exploration was during the week following menstruation, from the fourth to the twelfth day. At this period adnexal reactions could be most effectively avoided, and, moreover, the risk of injecting during pregnancy was eliminated by choosing a time shortly after menstruation had occurred.

The patient had to be prepared for the examination with the greatest care. It was necessary to be sure that the cervical orifice was permeable for the introduction of a sound, since radiographic examination must never be immediately preceded by dilatation of the cervix. The examination itself must be made with the care and precautions due to minor gynæcological procedures, and the patient must remain in the hospital or clinic for a few hours before returning to her home. This was essential in order to ascertain whether the tubes were or were not permeable. A second radiogram had to be taken a few hours after the first one to see whether the shadow still remained in the tubes or was disseminated in patches in the abdominal cavity. The gynæcologist and radiologist must collaborate in the examination, which was not painful. The only disagreeable moment for the patient was when the cervix was grasped with the forceps in order to close it, since injections made to study sterility must be made under pressure. The pressure employed must be regulated with a manometer, and must not exceed 30 cm. of mercury. By prolonging the pressure sufficiently it was often possible to restore permeability to otherwise impermeable tubes. Examination must be made patiently and without haste. The passage of lipiodol into the cervix and then into the tubes, which it entered through the mechanism of the uterine contractions, must be followed radioscopically on the screen.

To avoid pain, Dr. Lobre said that she was in the habit of giving sodium bromide or benzyl benzoate for two or three days before the examination, and a suppository of hempynal was introduced one and a half hours before the examination, which was immediately preceded by swabbing the cervix with a solution of novocain. The opaque substance used was 40 per cent. lipiodol, rendered more liquid by warming on the water bath. Many instruments had been devised for injecting lipiodol, that constructed by Dr. Lobre consisting of a cannula of very malleable nickel-plated copper, bearing a tip shaped like an olive, with a terminal orifice and two large lateral eyelets. The cannula bore a flattened shoulder, situated 4½ cm. from the tip, designed to prevent it from passing too deeply into the uterus. At the other end of the sound there was a three-way cock, bearing two threaded tips. The metallic syringe was attached to one end of the tips, while upon a lateral tip was fitted a sterilisable tube containing a piston attached to which was a manometer. The patient was placed on the table lying on a draw-sheet, which enabled her to be moved easily. At the end of the table were two movable stirrups, which permitted her to be placed in the gynæcological position. The vagina was irrigated with an iodised injection, and the cervix then exposed by a bivalve speculum. It was swabbed with alcohol and grasped with the tenaculum to permit easy introduction of the metal sound. If the cervical os was large it could be closed with a large forceps, with the grasp directed backwards. If small it could be closed with the aid of one or two bullet forceps. The oil was injected slowly, at a pressure never exceeding 30 cm. Care must be observed not to permit reflux into the vagina. The speculum should then be removed and the patient pulled into the middle of the table by means of the draw sheet.

For radiography the Coolidge or Phillips tube was employed, one tube being beneath the table for examining radioscopically with the patient recumbent, and for making plates during the examination, a plate being placed on the abdomen. Plates were also made of the pelvis, both from the front and the side. When the course of the tubes was masked by the uterine cavity an oblique exposure was taken. It was possible to take anterior or posterior plates without changing the position of the patient. The plates were developed immediately and before the sound was withdrawn. In this way the work might be repeated, if not wholly successful the first time. It was absolutely necessary to follow on the fluoroscopic screen the intra-uterine course of the injected lipiodol to observe the filling of the uterus, the successive aspects of the injection, the advance of lipiodol into the tubes, and its entrance into the peritoneal cavity. These details were clearly visible by making use of the Potter-Bucky diaphragm and of a fixed or mobile grill.

Dr. Lobre then proceeded to illustrate on the screen the information which could be supplied by radiographic examination—anomalies of development and variations in the form and dimensions of the uterine cavity and in the position of the uterus. Examination showed alterations of the uterine mucosa, polyps, submucous fibromas, tumours, and other conditions which might require curettage; also the sensitiveness of the uterus and the irritability induced by application to the mucosæ of severely caustic agents. Lesions of the tubes, which might escape detection by clinical examination, could be shown, notably those causing impermeability of the cornu, or at the isthmial region. Variations of the length, calibre, and form of the tubes could also be observed. The contractions which were clearly visible in normal tubes did not occur in diseased tubes, which were distended with lipiodol, which they retained for a very long time. In certain sterile women the tubes were firmly fixed by adhesions, remaining always immobile.

Conclusion.

Such were the lessons, anatomical and physical, revealed by hystero-salpingography. However highly the method might be perfected it would never constitute a specific treatment for sterility, since some forms were not of a mechanical type. The method confirmed and precisely demonstrated the clinical findings, and likewise supplied data giving rise to new medical and surgical methods of treatment. For combating uterine or tubal spasm, we might employ antispasmodic agents, such as belladonna, atropine, benzyl, or the bromides might be used. Tubal atony might be treated with gynæcological massage or diathermy, which were equally useful in uterine displacements. If the tubes presented unduly small calibre they might first be rendered permeable by injecting them with lipiodol, and their dilatation might then be attempted by repeating insufflation for a sufficient number of times.

Restorative Surgery.—Before undertaking operative measures designed to combat sterility, hysterography should be practised. Ligamentopexy or stomatoplasty should not be attempted without being assured that the tubes were permeable. If permeability was not present an attempt should be made to restore it. Twenty operations of this kind had been undertaken by Dr. Lobre, following advice based on radioscopic findings. Thus far the results had not been satisfactory, and in no case had pregnancy followed surgical treatment. Operation had generally proved to be too late, and had revealed old and already organised lesions. In the future operation must be done earlier, indications must be more clearly defined, and technique must continue to improve. Radiographic examination not only permitted ætiological diagnosis, but often sufficed in itself to constitute the treatment of certain forms of sterility. Various statistical records had shown, like those of Dr. Lobre, that pregnancy might be obtained in about 10 per cent. of the cases examined. While this might seem a very modest result, it must be remembered that the method was resorted to when every other method had already failed. Again, the figure of 10 per cent. was a gross figure, and included the cases in which the tubes were *permanently obliterated*. In many cases tubes originally considered impermeable proved capable of receiving injections, provided that the cervix was well drawn down and the pressure continued for a sufficient time.

By following the principles described by Dr. Lobre, she and her colleague had obtained 23 pregnancies following 230 injections with lipiodol. In three of these successful cases a second pregnancy had occurred, and in one case a third. There had been only one case of extra-uterine pregnancy.

Discussion and Reply.

The PRESIDENT pointed out that the method might not be very easy to apply in private practice where facilities for re-examination after three or four hours might not be easy to obtain.

Lady BARRETT inquired how it could be ascertained with certainty that no infection of the tubes existed. Was Dr. Lobre confident that forcible injection into the tubes was safe?

Prof. LOUISE MCILROY expected to get more than 10 per cent. of successful results with douching and other methods, including insufflation. It was sometimes difficult to detect pus in the tubes, and if injections were made in the presence of a pyosalpinx trouble was to be expected. A closed tube had possibly been the subject of inflammation at some time.

Miss L. MARTINDALE asked what results had been obtained by Dr. Lobre by means of artificial insemination.

In reply, Dr. LOBRE said that some gynæcologists sent patients to a radiologist and allowed them to go straight home, but she preferred them to lie in bed for one or two days, and the examination, therefore, must take place either in a hospital or clinic. None of the patients had had a rise of temperature after the injection. She had had no successful cases after artificial insemination. The results after lipiodol were possibly better than they appeared to be, because hospital patients did not always report subsequent pregnancies.

Dr. JANE WALKER proposed, and Prof. MCILROY seconded, a vote of thanks to Dr. Lobre for coming to London to give this valuable address.

MEDICINE AND THE LAW.

Dr. Knowles's Appeal.

THE successful appeal of Dr. Benjamin Knowles raised a large issue but did not adequately determine it. Employed as medical officer by the administration of the Colony of Ashanti, he was found guilty of murder and was sentenced to death in November, 1928, by the Acting Circuit Judge, who tried the case without a jury. The death sentence was commuted by the Governor of the Gold Coast, and a year ago Dr. Knowles was granted special leave to appeal to the Judicial Committee of the Privy Council. Last November his appeal was heard and his conviction was quashed, and now in the present month the Judicial Committee has announced its reasons. The foremost and, as it seemed, the strongest of the four grounds of appeal was the contention that the court in Ashanti had no jurisdiction to try the appellant upon a capital charge without a jury. Professional men, contemplating service oversea, may indeed have realised with surprise that one of the risks of such service is the absence of the accustomed judicial safeguards. In Ashanti trial by jury is unknown. The local criminal procedure is governed by an Ordinance which prohibits the employment of barrister or solicitor. This Ordinance somewhat vaguely applies to Ashanti the law of the Gold Coast Colony; in the latter Colony, trial by jury would be imperative where the alleged offence is a capital charge; the Ordinance, however, applies the Gold Coast law to Ashanti only "so far as it is practicable and local circumstances permit." The Judicial Committee now declares that practicability and the state of local circumstances are questions which can only be determined in Ashanti on the spot. The appellate tribunal in Downing-street says it can form no opinion on these questions; their lordships assume that the proceedings against Dr. Knowles in Ashanti were in order, and that, if he was not tried by a jury, that was because a jury was not practicable in the state of local circumstances. Thus the final stage of the Knowles case contributes little to the problem which the earlier stages had forced upon public attention—the problem of the legal rights of British officials serving in remote places oversea.

It would, of course, have been administratively inconvenient if the Judicial Committee had held that Dr. Knowles should have been tried by a jury. Many existing convictions might have been invalidated; arrangements would have been required in many places to remit to more populous centres an accused person charged with a serious offence; racial issues might have been raised by questions of the selection of jurymen. Equally it would have been forensically inconvenient if the Judicial Committee had held that Dr. Knowles's trial must be reviewed upon the facts; the result would have been that their lordships would have been overwhelmed by avalanches of appeals from all over the Empire; their well-established rule is not to intervene in criminal cases unless there is either some want of jurisdiction in the court of trial, some disregard of the forms of legal process, or some violation of the principles of natural justice with its resultant injustice. The final judgment in Dr. Knowles's case avoids the inconvenience of multiplying prospective appeals; it fastens upon one point peculiar to his trial and it offers no general encouragement to other appellants. The Judicial Committee's pronouncement may thus be paraphrased: "This appeal came to us primarily on the issue of trial by jury; we reject that issue as a ground of appeal, but, having examined the proceedings, we find that the Acting Circuit Judge misdirected himself; we are not an ordinary court of criminal appeal, we are not considering if the evidence supported the verdict, we are not saying what our own verdict would have been, but we find that the Judge summed the case up to himself in a manner which would have been misleading if he had been summing it up to a jury." A shot was heard, it will be recalled, in the room where Dr. and Mrs. Knowles were alone together; Mrs. Knowles, after saying it was an accident, died of a bullet wound; Dr. Knowles said there had been a domestic fracas; she had been nagging him, and he had said that, if she did not stop, he would put a bullet in her. The Judge rejected any idea of the wound being either self-inflicted or due to accident; he held that the shot had been fired by Dr. Knowles; he decided in consequence that murder had been committed. The Judicial Committee says that to fire a shot in a fit of drunken recklessness to silence a nagging woman would be a crime, but the crime might possibly have been manslaughter, and not murder. The Judge never dealt with the possibility of mere manslaughter; the appellate tribunal, observing this omission, is not satisfied that the evidence reached the standard of proof necessary for a conviction for murder. And so Dr. Knowles has won his appeal. Persons not learned in the law may wonder that it should be so complicated a process to set aside what was evidently an unsatisfactory conviction.

COVENTRY AND WARWICKSHIRE HOSPITAL.—This institution last year treated 14,305 accident cases. There were 5090 in-patients and 24,917 out-patients. Nearly 800 patients were sent to the Alcock Convalescent Hospital, which has added £3250 to the annual expenditure. The income, at £40,895, showed a deficit of £3464. The Godiva pageant produced £5000.

Reviews and Notices of Books.

TRAUMA, DISEASE, COMPENSATION.

A Handbook of Their Medico-Legal Relations. By A. J. FRASER, M.D., Workmen's Compensation Board, Winnipeg. London: Macmillan and Co., Ltd. 1929. Pp. 524. 28s.

THIS book is written mainly for that large body of medical practitioners who are occasionally called upon to express opinions on the relation between "an accident arising out of and in the course of employment" and the disability which prevents the patient from working. The writer has been for 12 years the chief medical officer of the Manitoba Workmen's Compensation Board, but his book contains all too few of his own personal opinions; instead he gives lengthy quotations from text-book authorities on every aspect of the questions under discussion. The subjects are further illustrated by the findings of various courts in different parts of the world. Most of the decisions recorded are those of the Manitoba Compensation Board, but there are many from the English courts. It is noticeable how much more elastic are the rules governing procedure in the Canadian Workmen's Compensation Boards than those of our own county courts. In Canada each case is decided strictly on its merits, whereas here so many adjudications are bound by decisions given upon the merits of some case heard long ago.

In the first chapter a clear explanation is given of the exact meaning of "an accident arising out of and in the course of employment." The responsibilities of the employer and the employee are set forth and, what is often forgotten, the responsibilities of the workman to his master. It is explained that if an injured workmen is unreasonable in refusing to undergo operation or to attend hospital, or even to do light work, thus retarding or preventing his recovery, he may be held no longer entitled to compensation. Where disease is alleged to be due to accident, rules are laid down for the guidance of the medical jurist. To establish any causal relation between the accident and the outbreak of disease there must be a direct sequence or march of events. Where an interval of recovery occurs, the presumption is absolutely against the causal connexion with the injury. In the chapter on the heart and blood-vessels the well-known "spanner case" is given at length. In this case judgment was given for the dependents of a man who died suddenly whilst commencing to screw a nut with an 18-inch spanner. (Clover, Clayton and Co. *v.* Hughes, 3 B.W.C.C.) It was held that although the man had an advanced aortic aneurysm and was liable to sudden death at any moment, it was the slight strain of turning the spanner which was the immediate cause of the rupture of the aneurysm. The author notes that "such precedents in a large and ever-growing class of marginal cases of industrial liability have so extended the horizon of compensation law that it is difficult, or impossible, to indicate where the boundaries of industrial liability are to be drawn." This is obviously true, and it is the more remarkable that few employers seem to have any organised method of classifying their workers according to their age and physical capacity, and selecting the physically fit for the heavy and laborious tasks. In the absence of such a scheme the old man or the impaired man falls out by the way, often as the result of some single undue effort. This failure to fit together in the best way the flesh and blood components of the industrial machine explains in some measure the ever-growing army of pensioners carried by industrial boards.

If any section deserves special mention it is the chapter on hernia. The liability for hernia is always a difficult matter to decide, and the description of the condition and the rules laid down for determining its relation to accident are excellent.

The medical jurist will find real help and guidance in this book when he is confronted by a case of unusual difficulty, and practitioners will consult it with profit on any question arising out of the preparation of medical reports in cases of accident.

OBSTETRICS.

Clinical Obstetrics. By PAUL T. HARPER, Ph.B., M.D., Sc.D., F.A.C.S., Clinical Professor of Obstetrics, Albany Medical College. Philadelphia: F. A. Davis Company. 1930. Pp. 467. $8.00.

UNLIKE so many new books on subjects whose literature is extensive this is no recapitulation of standard text-book teaching. In the author's own words, it is "a story of individual reaction to obstetrical problems as they have presented themselves . . . . deductions that individual situations seem to warrant replace extended comment and multiplicity of views." Of particular interest are the author's views on Bandl's ring and difficult labour. There is little doubt that a contraction ring is much more frequently the cause of difficult labour than is generally recognised. The text is freely illustrated by thumbnail diagrams which often hinder rather than help the reader. The style is not very clear; in some places perfectly simple facts are so lost in a maze of words that the reader fails to realise that some well-known phenomenon is under discussion and imagines himself to be digesting some new and original idea.

This is no book for any but the advanced student. By careful concentration he will learn new conceptions of his problems, some of which he may accept. It is a pity that an author with so much to say is unable to present his learning in a more convincing manner.

Nurses Handbook of Obstetrics. By LOUISE ZABRISKIE, R.N. London: J. B. Lippincott Company. Pp. 535. 12s. 6d.

THIS is an American book written for American nurses who take midwifery as part of their general training. It is not written for the practising midwife, and hence the teaching is largely theoretical. It might be described as an elementary text-book of obstetrics to which has been added mothercraft and home nursing. The author seems to have given a great deal of attention to practical aspects of home nursing, and many valuable suggestions are given as to the uses of domestic articles in the labour room. Minute details are given about the toilet and clothing of the infant.

The nursing details will be read with interest and profit by midwives and social workers, but it is difficult to see a place for the rest of the book in any other than its national environment.

ECLAMPSIA.

The Improved Prophylactic Method in the Treatment of Eclampsia. Third edition (first English edition). By Prof. W. STROGANOFF. Edinburgh: E. and S. Livingstone. 1930. Pp. 154. 10s. 6d.

FEW important therapeutic measures have been less well understood than Stroganoff's improved prophylactic method in the treatment of eclampsia. At intervals, Prof. Stroganoff has published papers in the medical press of this country in which he showed that his results were far superior to any obtained by other workers. He has travelled abroad to advocate his method, but his most willing disciples have had difficulty in understanding exactly what his method entails.

When Prof. Stroganoff visited this country in 1924 his knowledge of our language was small. Realising the difficulty of accurate translation, he started at an advanced age to learn English and now presents a book written by himself in English. He begins by answering his critics and reviewing the history of the treatment of eclampsia. He then explains at length the rationale of his method, the results of modification, and discusses his own results. Twenty-five pages are devoted to typical cases, and he concludes with a detailed scheme of treatment which none could fail to understand. It is almost unnecessary to remind our readers that Prof. Stroganoff has treated 320 cases of eclampsia with a mortality of 2·6 per cent. and has had a consecutive series of 166 cases without a death. This result speaks for itself. Eclampsia is now a comparatively rare disease, yet in 1928 the Registrar-General reported that there were no less than 557 deaths from puerperal albuminuria and convulsions in England and Wales. If Stroganoff's results can be repeated in this country, this number should be reduced to a fraction of its present size.

This book is an important addition to the literature of obstetrics, and should have the widest possible circulation.

THERAPIE INNERER KRANKHEITEN.

By Prof. Dr. A. GOLDSCHEIDER. Berlin: Julius Springer. 1929. Pp. 420. R.M. 28.80.

THIS volume offers a concise review of the treatment of medical diseases from the pen of one who has had for very many years good opportunities of studying them. Prof. Goldscheider has not attempted to include more than a passing reference to either ætiology or diagnosis, and has throughout maintained an admirably practical outlook on treatment. Therapeutic methods which have little application in general practice, or those which have not yet been tried out, receive scant attention. In the introduction the author warns the practitioner against too wide a use of ready-made combinations of drugs and preparations such as appear to be so popular in Germany to-day; simplicity is aimed at in the prescriptions set out, though proprietary preparations are not unduly neglected. The book is divided into a preliminary section on general therapy including the treatment of fever, pain, insomnia, and anorexia, with a brief summary of physicotherapy. The second section on special therapy contains chapters on the treatment of diseases of all the main systems of the body in which all the commoner conditions are fully described. Children's diseases are not included. The indexing is not very full and there is no means of referring directly to any special drug. English readers will be compelled to transpose prescriptions from the metric to our own system. This volume provides a balanced and concise account of practical treatment and is well representative of the present-day outlook of German physicians.

IMMUNOLOGY OF PARASITIC INFECTIONS.

By WILLIAM H. TALIAFERRO, Ph.D., Professor of Parasitology, University of Chicago. New York: The Century Company. 1929. Pp. 414. 25s.

OWING to the dominant morphological viewpoint adopted by many past investigators, the value of immunity studies in protozoology and helminthology has been unduly depreciated. By grouping in orderly fashion so heterogeneous a collection of immunological data as is presented in this volume, Prof. Taliaferro has made an important contribution to medical literature and one which should focus the attention of tropical workers in particular on the deficiencies and gaps in present knowledge of this important subject.

Many phases of parasitism and immunity are unfolded in this volume, including some interesting comments on the environment of parasites compared with free living animals. Special chapters are devoted to lysins and reproduction-inhibiting antibodies in relation to the types of infection in trypanosomiasis and malaria, and also to the protective and curative action of immune sera in certain protozoan infections. The cellular basis of immunity and the nature and production of immunity in parasitic diseases are dealt with.

The serological reactions reviewed include the complement-fixation and precipitin tests; by these means specific antibodies have been demonstrated in many protozoan and metazoan infections. In man they are of proved clinical value only in hydatid disease and schistosomiasis, though in the author's opinion there seems to be considerable promise that they may be applied to amœbiasis and trichiniasis. Three types of skin reaction are described all of which depend upon a hypersensitive condition of the host. Of these there is little evidence that true local anaphylaxis or the Arthus phenomenon ever occurs in parasitic infection, but unquestionably both the immediate wheal and the delayed response occur in man and animals infested with helminths. As these reactions are not necessarily correlated with humoral antibodies, skin tests and serological reactions should be conducted simultaneously.

This volume is written with judgment. It is well indexed, and possesses an admirable bibliography.

PLANT BIOLOGY.

By H. GODWIN, M.A., Ph.D. London: Cambridge University Press. 1930. Pp. 265. With 67 figures. 8s. 6d.

THE loyalty of Cambridge students of elementary botany to Prof. A. G. Tansley's book must be rather seriously strained by the publication of this excellent introduction to the study of plants by another Cambridge teacher. It is written from the physiological rather than the anatomical point of view by one who is a physico-chemist rather than a biologist, and it gives a clear and interesting account of what plants are and how they live. Where the author goes wrong is in deliberately trying to adapt his book to the use of medical students and using as illustrations examples which he supposes are of particular moment in medicine. This leads him into fields with which he is obviously not familiar and his account of pathogenic bacteria is misleading in many particulars. Fermentation reactions are described as the "only" means of separating colon and typhoid bacilli; spores are characterised by "taking stains easily"; the chief "significance" of bacteria to man is their power to cause disease, though of course the author knows quite well that human life would be impossible if bacteria did not run the nitrogen cycle; bacteria are said to cause their ill-effects "sometimes by the direct breakdown of the body tissue as food material." If the student remembers any of this, it will have to be undone by his bacteriological teacher, and Dr. Godwin gives yet another example of the futility of trying to make the medical curriculum overlap upwards. By so much as chemists try to teach physiology or physiologists purport to teach pathology or pathologists pretend to teach clinical medicine, they are discharging their proper function badly and their teaching will be bad. Overlapping must be downwards, not upwards.

DR. AND MRS. JOSEPH COATS.

Compiled by their Daughters. Glasgow: Jackson Wylie and Co. 1929. With 13 plates. Pp. 330. 5s.

Joseph Coats (1846–1899) was the first professor of pathology in the University of Glasgow, and he wrote one of the earliest English text-books of pathology. He was also a good man and had a good wife, who survived him for 28 years. Their daughters have put together a book of remembrance which makes a delightful tale of happy, useful, friendly lives. It will be, of course, particularly interesting to their own circle, which was a large one; there is perhaps not quite so much about Coats the pathologist as we should wish. But how a throat specialist who had visited Recklinghausen taught his university that there was a new discipline which they would have to recognise is a significant piece of the history of the medical sciences. Everyone knows how fruitful Coats's work has been in Glasgow; and this book reminds us how young pathology is.

THE LANCET.

LONDON: SATURDAY, MARCH 29, 1930.

THE OPHTHALMOLOGICAL SOCIETY:

FIFTIETH ANNIVERSARY CONGRESS.

THE Ophthalmological Society of the United Kingdom celebrates at its Congress next week the fiftieth year of its existence. It owed its origin to a small but distinguished band of ophthalmic surgeons who were in the habit of meeting, rather casually and from time to time, at Moorfields. A more formal meeting at the house of Mr. Bowman (later Sir William Bowman), in February, 1880, resulted in the definite formation of the Society whose first meeting took place on June 23rd, 1880, under the presidency of Mr. Bowman. One of the members of the inaugurating committee is still with us in the person of Sir Thomas Barlow, who has kindly undertaken to respond to the toast of the Society at the Jubilee Banquet, which takes place on Friday, April 4th, in the Fishmongers Hall. Among the members of the first Council of the Society, in addition to the President and Sir Thomas Barlow, were many who had already, or who subsequently achieved distinction in the world of medicine. George Critchett, Jonathan Hutchinson, Hughlings Jackson, and Swanzy were Vice-Presidents; Edward Nettleship and Stephen Mackenzie were the Secretaries; and Gowers, Brudenell Carter, Hulke, Henry Power, and Waren Tay were some of the members of the Council. Of the 114 original members of the Society, 11 still survive, but distance and in some unfortunate instances the physical disabilities of age will prevent the majority of these from attending the meetings next week, but Sir George Berry and Mr. J. B. Lawford have both promised to come and, with Sir Thomas Barlow, will represent the founders. A number of distinguished foreign ophthalmic surgeons will also be present as guests of the Society, among them being Prof. van der Hoeve, President of last year's International Congress at Amsterdam, Prof. Márquez, President-elect of the next International Congress to be held in Spain in 1933, Dr. de Schweinitz and Dr. Morax, both aforetime Bowman Lecturers, Prof. Lundsgaard, Chairman of the International Council of Ophthalmologists, and Prof. Terrien, of the Hôtel Dieu, Paris. A programme of the Annual Congress, to be held next week, will be found on p. 729.

The 49 published volumes of the Transactions are ample evidence of how fully the Society has borne out its original aspirations. In the first volume appears Waren Tay's description of the disease now known as amaurotic family idiocy. Later volumes showed the first cases of the allied form, the Batten type of cerebro-macular degeneration. In the first volume, also, is the most admirable account of optic neuritis in cerebral lesions by Hughlings Jackson, which can be read with profit at the present time. This subject continues to bulk largely in the early volumes. In Vol. III. appears Lawford and W. Edmunds's paper on the pathology of optic neuritis, while further papers on the same subject in Vols. IV. and V. show how thoroughly the new group of workers were justified in the formation of a group of intensive workers. Indeed, to go through these transactions volume by volume, picking out papers of importance which have contributed to the advance of special knowledge, would amount to a syllabus for an exhaustive system of ophthalmology. The Bowman Lectureship was instituted in 1885 to commemorate the first President and the first lecturer was Dr. Hughlings Jackson. Many men of great distinction, British and foreign, have given this lecture, and this year, Sir Arthur Keith, President of the British Association, will discharge the office appropriately, speaking on "The Genius of Sir William Bowman."

The obvious value of the new Society was recognised almost at once, as the columns of THE LANCET show, and its activities found expression at a time when the level of ophthalmological knowledge expected from the young practitioner demanded an elevation which it was not receiving. It became felt almost immediately that the Society would be of great assistance in bringing about needed reforms and thus it assumed in its earliest days its great position. In 1912 the question arose of fusion with the Royal Society of Medicine, and for a time the future of the Society was in doubt. The arguments for the amalgamation were strong, if only because of the close and perpetual inter-relation between ophthalmology and the whole of medical science; and some such view as this did find expression among certain professional leaders at the time of the formation of the Society. But when the Royal Society of Medicine was founded it was felt that the tradition of good work so well and truly laid should not be lost, while it might be submerged if the Society lost its identity in the greater Society. The decision taken then has proved a wise one. The Society made itself responsible for running an Annual Congress and agreed to leave the monthly meetings to the Section. That arrangement has resulted in building up a strong Section of Ophthalmology in the Royal Society of Medicine; and the Ophthalmological Society, despite the fact that it has budded out into numerous off-shoots, is itself now stronger than ever, and works in complete harmony with the Section. If we may judge from the quality of the work that is being done at present by some of the younger members of the Society, it will maintain its place well in the forefront of the ophthalmological world and produce in the next 50 years work in every way worthy to stand beside the work of the last 50 years.

MENTAL TREATMENT BILL AND THE BOARD OF CONTROL.

THE progress of the Mental Treatment Bill in Committee has been disappointingly slow, nevertheless the main principles of the Bill seem secure and, unless there be unforeseen delay, it may be expected this valuable alteration in the law will be passed without serious amendment. The chief provisions—the admission of voluntary patients in public mental hospitals, the provision of temporary treatment for persons not objecting to it, and the obligation placed on local authorities to provide treatment for early or incipient cases of mental illness—have already been passed. Whilst there is certainly ground for criticism regarding details, we have no doubt that the measure will provide treatment for a large number of persons now drifting towards insanity without any care or treatment, and that many of these will recover without certification and without any Justice's Order being required. In the future we may expect that recent cases will either be treated as voluntary patients or under the new clause providing temporary treatment, and it is satisfactory that this treatment will be available for the poor as well as the rich. We presume that only in the case of those refusing treatment will the present procedure be necessary. For unrecovered cases, still needing care, certification will be continued. The new feature of the temporary treatment clause lies in the fact that persons unable to decide for themselves can be received in a hospital, nursing home, or private house on the recommendation of two medical men, one of whom must be approved by the Board of Control. The place of treatment must in like manner be approved by the Board. It remains to be seen how this will affect medical practice, and whether the same unwillingness to recommend will obtain as that which exists in regard to certification. A new amendment was passed last week which required the medical man to give his reasons for his recommendation, and this brings the procedure very close to certification, and, moreover, greatly adds to the difficulty of the practitioner should at some future time his action be called in question. How far Clause 16 will effectively protect him from vexatious ligitation is not clear.

It was decided in Committee to discontinue the appointment of honorary commissioners, but it was agreed to consider the appointment in some other places of unpaid assistance. One reason for this was the desire to reduce the number of senior commissioners who will in future constitute the Board of Control. Perhaps some who voted against continuing the present system objected on principle to unpaid public servants. We think this decision unfortunate. When one considers the large amount of devoted work done by unpaid commissioners in the past, it seems a mistake not to take advantage of their service. Especially in respect to mental deficiency administration have honorary commissioners done an immense amount of work. These appointments make it possible to secure the services of retired commissioners and other experienced public men who cannot accept the obligations of a salaried post. We consider they add to the status of the Board and give public confidence in its decisions. The other matter which is of grave importance is the constitution of the Board itself. It has been decided that it shall consist of five senior commissioners, of whom one must be and two may be medical men. For many years the Board of Control has not been able to cope satisfactorily with all the duties laid upon it by statute. Its numbers have not increased proportionately to the increase of patients and all the extra work involved in administering the Mental Deficiency Act. Now it is to be given additional work. Under the Bill, the Board of Control will have to approve hospitals and homes for patients admitted voluntarily or, under the temporary treatment clause, must approve the doctors giving recommendations. Moreover, notifications, recommendations, and reports will bring to the office an additional torrent of papers that will require expert examination, and, besides all this, temporary patients will have to be visited, and the working of the new provision directed and supervised. Whilst it may be probable that many of the duties of the Board can best be performed by a small body which can meet frequently, we cannot but fear that the grading of the commissioners into two classes may have a prejudicial effect on what is really the most important part of their work. We believe it is necessary that the Visiting Commissioners should be men and women of standing so that their recommendations may carry weight with local authorities. Their position is essentially different from that of inspectors, in that they are appointed by the Crown to safeguard the liberty of individuals, to protect insane persons from neglect or cruelty, and to prevent suffering through the parsimony of local authorities. The KING is the protector of all who are not of sound mind, and he appoints the commissioners to act for him in this respect.

At first it may be thought that mental disease is only a department of medicine, and that mental hospitals should be under the direct supervision of the Minister of Health in the same way as poor-law hospitals and infirmaries. But the Royal Commission unanimously reported that the Board of Control should retain its independence, except that the majority of its members should be appointed by the Minister of Health, and he should represent it in Parliament. The present Bill does not actually alter this, but in the course of the debate several remarks were made which gave the impression that it was really desired that the Board of Control should in effect become a department of the Ministry of Health. We realise that in 1845, when the then Lunacy Commission was instituted, there was no Ministry of Health, and it is extremely unlikely that, in modern conditions, the old abuses will recur. It is, however, certain that to some extent evasion of the law will continue, and that "back parlour" treatment for private profit will occasionally occur. It is also certain that some local authorities will be slow to realise their responsibilities towards the insane and defectives, and unless the Board of Control and the Visiting Commissioners be such as command confidence there will be danger that neglect and even abuses may arise. Therefore we would urge that, whatever may be done, the Visiting Commissioners, medical as well as legal, should be persons of a standing that can command respect from local authorities and the highly trained medical officers in control of the mental hospitals. We would deplore any step which may weaken the authority of these public servants. Their status and conditions of appointment must be such as will attract men and women with professional attainments of a high order.

MEDICAL PATENTS.

REFORM of British patent law has been in the minds of many groups of people during the past few years, and while, no doubt, it is the manufacturers of dyestuffs and chemicals who most desire to see some change, it is significant that a representative committee of chemists should devote one-third of a long memorandum to the question of medical patents. This memorandum is summarised on p. 718, in so far as therapeutic and biological substances are concerned. The medical profession has itself from time to time expressed strong views on this subject, its attitude, as the chemists' memorandum points out, being mainly against the patenting of therapeutic substances. The objection rests in principle on two grounds. First, that it is undesirable for a medical man to derive financial benefit from any discovery made for the relief of human suffering; secondly, that to patent any such discovery might lead him to take unfair advantage of colleagues. The manufacturer's point of view is different, but it requires close attention, inasmuch as medical discoveries of a therapeutic nature are useless without active and sincere commercial coöperation. The manufacturer is in favour of restriction because it enables him to put on the market substances requiring great expenditure on plant, time, and personnel. While the medical inventor may be able to sweep aside any thought of financial gain from his discovery, it is absurd to expect the manufacturer to make the substance invented unless he can look to a reasonable profit from his enterprise. It would seem at first sight as though the main problem facing the Board of Trade's Patents Committee is to reconcile these opposing forces—the financially disinterested medical inventor on the one hand, and the profit-making manufacturer on the other. Each of them is called upon if the British public is to obtain the full benefit of scientific work. Unless there is some liaison between them, it is quite feasible for a foreign manufacturer to investigate an unpatented process described by one of these disinterested English workers, and by discovering a minor modification in the final stages to obtain a patent which would exclude the British manufacturer from starting to make the substance in question, or from going on if he had already begun. This has occurred many times. Whilst the position of the manufacturer is clear enough, the public may not find it so easy to understand the attitude of the medical inventor. The bodies which have had the matter under consideration, whether it be the Medical Research Council, the Ethical Committee of the British Medical Association, the British Science Guild, or the Association of the British Chemical Manufacturers, all assume that the medical man does not desire to make money from his invention. This attitude may reflect that of the medical profession without being exactly logical. It does not necessarily follow that the medical man who patents a discovery would be biased in his treatment of patients nor, perhaps, is that so much the apprehension as that he should swell his clientèle by the attraction of novelty. The type of medical man who discovers a therapeutic substance, capable of manufacture on a large scale and of sufficient importance to be protected from foreign competition, is unlikely to be engaged in medical practice. In ninety-nine cases out of a hundred he will be a worker in one of the scientific departments of a university or hospital, and the very nature of his discovery would demand that he should devote his whole time to the research in question. It is highly improbable that a physician, surgeon, or general practitioner would make a discovery of this type. The strictly professional attitude —at any rate hitherto—may be seen, therefore, to guard against what is in theory a great danger, while it may have no existence in practice. Nor can a medical man who makes money out of a scientific discovery be reproached for turning human suffering to financial gain, for in every branch of medical practice it is success in relief of suffering that brings position and emolument.

The middle way, now unanimously accepted by all the committees, is what is termed the system of dedicated patents. The medical man who discovers the preparation of a valuable therapeutic agent will patent the substance itself, and its method of manufacture, through an authority to be called the Public Patents Trustee. The patent will be dedicated to the British public, the patentee himself deriving no financial benefit from his discovery. The Trustee will issue licences for the manufacture of the substance to commercial firms, who will sell it to the public. The first free licence, it seems, will be granted to the patentee or to his nominee, but it is not quite clear whether or no this gives the patentee the opportunity of making a little money through his nominee. That the medical patentee will be entitled to have some say in the foreign rights follows from the provision: "the inventor will have the first option of taking out foreign patents, and if he exercises this he can deal with foreign royalties in the usual way." On the manufacturer's side, the Trustee will decide to whom the licence should be given, and in this delicate duty he is to be assisted by an advisory committee. It is the intention of the Joint Chemical Committee that royalties imposed by the Trustee should be of a nominal character, and should not more than suffice to cover the expenses of administering the dedicated patent. In other words, the medical inventor who dedicates his patent to the British public, after having worked early and late to obtain this valuable information, forswears all financial gain—with the possible exception of some slight advantage through the free licence and foreign rights. The medical inventor, or the hospital or university which has financed him, has borne the whole expense of his investigation, and the British public accepts the benefit. The manufacturers are given the right to make the substance, and the royalties imposed by the Trustee are to be "nominal." On the other hand, if a non-medical person were to come to the manufacturer with a patented process, he would not demand royalties of a purely nominal character. He would say that he had a very valuable preparation, that he had expended his brain, time, and money on producing the discovery for a patent, and that the manufacturers must be prepared to pay him royalties. If they decided that it was a good preparation, and one likely to bring in money, they would come to terms. When they deal with a medical man, they are prepared to take full advantage of the fact that he wants no royalties. The proposals as they stand savour of the heads-I-win-tails-you-lose type.

It is unfortunate that all the discussions on patent reform in connexion with medicine should turn on the financial question. The doctor must not make money, the manufacturer must be guaranteed his. Surely there is a wider principle than this at stake; that the public be supplied with really active preparations. It matters little who is obtaining a dividend of 5, 10, or 15 per cent. on the sales of (let us say) an endocrine preparation. The essential point is the potency of the preparation. Why should we not insist that any substance made under a dedicated patent should automatically be placed under the Therapeutic Substances Act, and that any firm operating under a dedicated patent should be bound to submit their products to the authority constituted under this Act? By this means doctor and public alike would be certain that the firm in question were producing an active substance in accordance with the principles laid down in the original publication. Again, should not all these committees recognise that, if the medical man is prepared to forego his financial right, the price of the final article as sold by the manufacturers should be controlled by the Trustee, more particularly so when they recommend that the royalty should be "nominal." While the patenting of dyes and heavy chemicals may be a purely financial problem, the manufacturers should realise that in medical matters the first and final consideration is the health and welfare of the general public. If the patent reform proposed is to ensure that substances manufactured under the scheme will be inspected and guaranteed accurate in accordance with the original specification, then it is a laudable scheme. If on the other hand it is merely concerned with the financial aspect of the situation, then the body of medical opinion must look upon it with grave doubt.

Annotations.

"Ne quid nimis."

PROBLEMS OF A CITY HOSPITAL.

CAREFUL students of hospital reports and statistics cannot avoid the conclusion that the outstanding difficulty of the voluntary hospitals is no longer the finance of the year, but accommodation. Though there are still deficits, they are smaller and less numerous, generally speaking, than a few years ago; but as this anxiety has lessened it has been replaced by the problems, often acute, of finding beds for waiting patients. The rather rapid growth of the "hospital habit" is not the only cause of the congestion, and the relation between cause and effect is neatly exemplified in the report for 1929 of the Royal Victoria Infirmary, Newcastle-on-Tyne, which may be taken as a typical, as it is certainly a model, city general hospital. The beds at its disposal —572—are obviously inadequate for an agglomeration of population such as that of which Newcastle is the centre, and it is not surprising that 22 extra beds have to be provided every day, a number sometimes considerably exceeded. In every great industrial centre there are many accidents, and last year Newcastle Infirmary treated over 22,000 such cases. That, of course, means pressure upon the out-patients department, rather than upon beds, but 1470 of these cases were the direct result of accidents with motor vehicles, and 436 of these patients —roughly, one third—had to be detained. The net result was the occupation of 20 beds each day throughout the year, which almost exactly accounts for the extra beds. Yet, revision of the list notwithstanding, there were 2603 patients waiting for these beds. The annual cost of each was £160 8*s.* 8*d.*

Overcrowding is one of the worst and most intractable troubles with which the hospital administrator has to deal. It impedes work which very often cannot endure impediment without evil results, and adds to the wear and tear of nerves and tempers which need to be exceptionally calm and serene. Yet it is not at Newcastle alone that these trying conditions exist; they are general throughout the country, and only experience will show to what extent the pressure will be relieved by that throwing open of the poor-law hospitals which takes effect next week. The relief is mathematically conditioned by the average number of vacant beds in these institutions. In some there are many; in others very few, but the adoption of the county or the county borough as the unit should facilitate the mobilisation of hospital resources. It is to be feared that, in face of the growing pressure, this source of help will not fill the gap for any substantial period, and at Newcastle, as in other great towns, this is clearly recognised both by the infirmary and the corporation. The one is perfecting its arrangements for utilising the premises vacated by the Ministry of Pensions, part of which will provide 86 pay-beds; the other proposes to set aside a portion of the Wingrove poor-law hospital to supplement the infirmary accommodation. Yet, undismayed by the existing pressure, Newcastle Infirmary is about to establish a complete orthopædic department as a separate unit of 50 beds, with its own out-patient annexe, and in view of the attention now being paid to orthopædics, and the comparative scarcity of machinery for dealing with it, there are not likely to be many empty beds in the new unit.

Enterprises such as this involve heavily increased expenditure, and it is beginning to be generally realised that the most certain and fruitful method of meeting enhanced current expenses is by the establishment of contributory schemes. The desirability of setting up such a scheme at Newcastle Infirmary has been discussed, but the Parliamentary Committee of the Newcastle Corporation has gone further and actually made the proposal. It seems no longer to be possible to confine any contributory scheme which, like the exceedingly remarkable Birmingham one, is pooled for all the hospitals of an area, merely to the voluntary hospitals. In a completely coördinated plan the municipal institutions must assuredly share in the advantages of a system which confers rights while saving self-respect.

FURTHER PROVISIONAL DEATH-RATES FOR 1929.

PROVISIONAL death-rates per million population for England and Wales during the year 1929 have been reported by the Registrar-General as follows:—

	Males.	Females.	Persons.
Respiratory tuberculosis ..	938	661	793
Other tuberculosis	185	148	166
Cancer	1386	1483	1437

The maternity mortality in 1929 per 1000 live births based on deaths primarily classed to puerperal conditions is given provisionally as follows:—

Puerperal sepsis	1·80
Other accidents and diseases of pregnancy and parturition	2·53

POLYCYTHÆMIA.

Dr. F. Parkes Weber and Dr. O. B. Bode[1] have done good service in systematising the conditions characterised by increase in the number of the red cells in the blood. They classify the polycythæmic states under the headings of erythrocytosis or secondary polycythæmia, erythræmia, hypertonic polycythæmia, and erythroleukæmia. In the first class fall all those cases of increase in the red cells following a response of the hæmopoietic system to a call for more tissue-oxygen. The physiological response is seen in the polycythæmia of high altitudes, but the same mechanism accounts for polycythæmia in certain pathological conditions such as stenosis of the pulmonary arteries, syphilitic pulmonary arteriosclerosis, and heart failure. Even in certain types of case which the authors class as "toxic"—notably the polycythæmia seen in chronic carbon monoxide poisoning, and in methæmoglobinæmia due to poisoning by the coal-tar derivatives—the same mechanism is probably at work. All cases of this type they would group under the name of erythrocytosis. Their treatment must naturally be directed towards the underlying causes.

Cases belonging to the Osler-Vaquez syndrome, which come under the heading of erythræmia, are distinguished from the foregoing by the presence, besides polycythæmia, of a grossly enlarged spleen, and the absence of any discoverable cause for the increase in the red cell count. They think this condition a primary disorder of the hæmopoietic system, comparable in every way to the leukæmias. That it is not confined to the erythrocyte-forming cells of the system is shown by the fact that the white cells, especially the polymorphs, are always increased in number, and that myelocytes and other abnormal forms of white cell may be present. If the leukæmias are to be regarded as representing a change in the blood comparable to malignant change in the fixed tissues—and there is much to support this view—erythræmia may be looked on as a malignant change mainly affecting the erythrocyte-producing portion of the hæmopoietic system. Evidence of the close relationship of erythræmia to leukæmia is afforded by those cases which start with the blood picture of erythræmia and finish with that of myeloid leukæmia with pronounced anæmia. These cases Parkes Weber and Bode would group under the separate heading of erythroleukæmia, but there seems little necessity for this further group. All cases of erythræmia may be regarded as potentially leukæmic. Frequent and copious bleeding and phenylhydrazine are regarded as the best means of treatment, and a special warning is given against splenectomy.

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[1] Polycythæmia, Erythrocytosis and Erythræmia. By F. Parkes Weber and O. B. Bode. London: H. K. Lewis and Co., Ltd. 1929. Pp. 34. 3*s.*

It is doubtful if the third group of Parkes Weber and Bode—polycythæmia hypertonica—needs to be differentiated from the first. Polycythæmia associated with high blood pressure was first described as an entity by Gaisböck, and on the continent rejoices in an eponym. High blood pressure is found in many cases of polycythæmia, both secondary and essential, and renal disturbances are not uncommon. All cases of polycythæmia might perhaps be brought together under the first and second of the authors' groups.

ANALYSIS OF PSYCHOTICS.

THE discussion at the Royal Society of Medicine on psychotherapy in mental disorder, which we reported last week (p. 625), revealed a divergence of view which may be explained in part by differences in scientific method and in part by differences of training and experience. On the one hand are psychiatrists whose work has been concerned principally with institutional material; on the other hand are psycho-analysts who for the most part have not had much to do with the type of psychotic found in mental hospitals and whose training in psycho-pathology has been predominantly on Freudian lines. Dr. Devine from a wide experience of confirmed psychoses again advocated the view, so ably expounded in a recent book, that the basic cause of psychotic manifestations is primarily "organic." He uses the term "organic" in a special sense as pertaining to the vegetative aspects of the organism, not necessarily the same as the usual clinical sense of "structural." With such a point of departure it is clear that the modifications which psychotherapy tends to produce—primarily at the psychological level of the integrated activities of the organism—cannot be considered as cardinal but must be regarded as symptomatic palliatives. Psycho-analysts, however, feel capable of explaining all the characteristic psychotic symptoms in psychological terms alone, deduced from psycho-analytical interpretation of the mental processes involved. The fact that these interpretations have not received by any means a universal acceptance, and that even those psychiatrists who are sympathetic towards much that is psycho-analytic are still sceptical of some of the most fundamental of the assumptions involved, naturally does not deter psycho-analysts from pursuing their working hypotheses. Dr. Glover refrained from doing much more than defining the ways in which by the special psycho-analytic methods of approach psychotics may become accessible to psychotherapy. He explained that the cases so far dealt with were too few and the time that has elapsed too short to justify final claims. We might add that a perusal of Abraham's pioneer psycho-analytic work on some depressive psychoses, mentioned by Dr. Sylvia Payne in her contribution, does not compel conviction of the validity of his interpretations.

But there is a viewpoint which in the discussion between organicists and psycho-analysts hardly received sufficient attention, although it is widely held among continental psychiatrists. For example, a distinction has long been made between the "fundamental disease process" and the "accessory symptoms" of schizophrenia. The fundamental process would correspond to Devine's organic substratum, while the accessory symptoms are presumably accessible to psychotherapy. Similar interpretations would make psychoses of manic-depressive type and also many cases of idiopathic epilepsy explicable on the basis of peculiar, sometimes inherited, responses to psychological factors. Here also psychotherapy should have a fruitful application in the resolution of the precipitating conflict. Another view regards schizophrenia, paranoia, and paranoid conditions as frequently the result of habit-deterioration, the psychotic development being traceable in the life-history, where traits of personality emerge of a type that leads to increasing maladjustment and finally to the rupture of compensation that we call the psychosis. Looked at in this way the therapeutic problem of the psychoses, as Dr. Gillespie pointed out, seems more hopeful, principally from the preventive aspect. This would involve working with children and adolescents in the pre-psychotic stages. Some confirmation is forthcoming both from recent psychiatric experience with children and also, it is interesting to find, from some instances of the psycho-analysis of children such as those quoted by Dr. Melanie Klein.

What the discussion principally brought out is the need for much closer rapport between the different investigators, psychiatrists and psycho-analysts. It is unfortunate that there should be such a division of opinion as springs from imperfect collaboration. It is clear also that there is much room for research into the predisposition to psychosis and into the possibilities of modifying the various factors while they are in the making. It would be most useful if a number of people, apparent candidates for psychopathy, could be followed and studied from childhood into adult life. Furthermore, an attempt should be made to disentangle the congenital or inherited and presumably less modifiable predispositions from those which are acquired and presumably more modifiable. Our county asylums, drawing upon a defined area of population, should be peculiarly well situated for the study not only of mental disease in families but of the inheritance of individual traits and tendencies. In the psycho-pathology of the developed psychoses themselves there remains a wide field for study. The relative dearth of articles on this topic published from mental hospitals in this country is in striking contrast with the number of researches on the physico-chemical condition of mentally sick patients. The problem of accessibility has not been sufficiently studied; a continuous search should be made for a technique of access. When these questions have been better explored it will become possible to discuss treatment, psychotherapeutic and otherwise, more effectively.

PULMONARY ASBESTOSIS.

IT is now recognised that the inhalation of dust generated in the manufacture of asbestos often gives rise to an insidious and progressive pulmonary fibrosis which is distressing in its effects and disastrous in its consequences. The value of asbestos depends upon its well-known resistance to heat and to the action of strong acids and alkalis. Its importance in the manufacture of fire-resisting articles, whether designed to protect against risk or for use in connexion with machinery, and the absence of any efficient substitute is the cause of ever-increasing demands upon the factories where the fibre-containing rock is crushed and the fibres spun and carded. The number of persons employed in the factories is already large and, as Sir Thomas Oliver[1] points out, many of the workers are young. In the past too little attention has been paid to their welfare, and the need for rigid standards of protection is urgent if further suffering and loss of life are to be prevented. The effects of the inhalation of asbestos are due to the silica which it contains, but the resulting fibrosis differs histologically from the nodular form seen in other types of silicotic lung—e.g., in gold miners' phthisis. The whorled formations seen in the latter are absent and are replaced by a diffuse fine interstitial pneumonia. The difference is also reflected in radiograms of the two conditions, the gold miner's lung showing scattered dense rounded opacities which contrast with the fine basal mottling and linear striæ which are characteristic of the asbestos worker's lung.

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[1] Oliver, T., Arch. f. Gewerbepath. und Gewerbehyg., 1929, i., Heft 2.

A peculiar feature of pulmonary asbestosis is the presence of the so-called asbestosis bodies. These were discovered by Prof. Matthew Stewart in the sputum of workers suffering from the disease, and they have been demonstrated by a number of investigators in sections from the lungs, and in lung juice removed during life by exploratory puncture or expressed at autopsy. The asbestosis body, which bears a curious resemblance to a minute crustacean, consists of a central core of asbestos fibre which appears to be embedded in a series of discs. One end of the fibre is often buried in a bulbous extremity, and this with the succeeding discs produces the appearance of a minute screw. The nature of the aggregation around the central spicule is unknown, but Gloyne[2] has been able to demonstrate the central fibre by exposing the containing body to the action of sulphuric acid.

THE SCIENTIFIC EXAMINATION OF PICTURES.

THE famous Italian pictures, which returned to their various homes last week, after being on crowded view in Burlington House for the past two months, evoked enormous general enthusiasm and, as was inevitable, certain discussions on the attributions. For more than ever is the authenticity of old masters becoming a serious financial matter, while the prices for genuine canvasses soar upwards under American desire of possession. It is significant of much that is happening in clinical medicine that recourse should be had to exact scientific methods in diagnosing the period of a painting and possibly the actual painter—critical acumen is taking its place with *tactus eruditus* as something personal whose value can be added to by employing the methods of laboratory technique. Dr. A. P. Laurie, professor of chemistry to the Royal Academy of Arts, has contributed to this month's issue of *The Analyst* an article—a record of a recent lecture delivered before his Society—upon the identification of pigments used in painting at different periods, in the course of which he gives a brief account of other methods of examining pictures. The technique employed closely resembles that of the pathological laboratory, and it is not suggested that the verdicts of these investigations are to take the place of the judgments of the instructed. Knowledge of the art of painting, its history, and the manners of the various schools, of brushwork, and of idiosyncrasies of well-known executants will remain the medium of identification, but the chemist and the radiologist can be drawn upon for assistance. Dr. A. Martin de Wild (see THE LANCET, Nov. 2nd, 1929, p. 932) has gone over the ground, when investigating the pigments used by the Dutch and Flemish masters from the fifteenth century onwards, and such a system of inquiry may give art critics a feeling, shared by many medical practitioners, that, with a disputed diagnosis as a possibility, the calling in of the chemist and radiologist is a measure of ordinary prudence.

PYELOGRAPHY WITHOUT CATHETERISATION.

GOOD results are claimed[3] for a new method of examining the urinary tract by means of a preparation called uroselectan. Since the advent of cholecystography urologists have been stimulated to search for a similar method applicable to their specialty. After trying various substances Lichtenberg and Zwick have hit upon an iodide compound which they call uroselectan, and it promises to be very useful for the purpose. As it is badly tolerated by the stomach it has been given by intravenous injection. Two injections are made at three minutes' interval, the first 40 c.cm. and the second 60 c.cm. of a 40 per cent. solution of the drug. Films may be taken a quarter, three-quarters, and one and a quarter hours after the final injection, and it is said that as a rule good shadows are obtained of the whole urinary tract. If, however, the renal function is depressed no shadow may appear for six hours or more, and the rapidity with which a pyelogram is obtained is therefore a rough guide to the efficiency of the kidney. The method may be regarded as a definite advance in urology. Where it is sufficient for diagnostic purposes it is obviously a great gain to the patient who is spared ureteral catheterisation, and it should also be useful in those cases in which the catheterisation is attended by special difficulties, as in advanced tuberculosis of the bladder. Uroselectan has already been tried by a number of surgeons in Germany and France, and is being tested in England. Mr. Frank Kidd records some observations in the current number of the *Journal of Urology*.

A FRIPP MEMORIAL.

A PROPOSAL has been made in the public press that a memorial to the late Sir Alfred Fripp should be instituted to perpetuate his memory, and we have received from the popular novelist, Major Hay Beith, an outline of the scheme which has been set in hand. It is proposed to invite public subscriptions to a fund to be devoted to the development and extension of the Children's Department of Guy's Hospital, the endowing of cots, the building of a new ward, or in such other manner as the governors of the hospital and Sir Alfred's own relatives may decide. The trustees of the fund will be Lord Lonsdale, Mr. Wilfred Godfrey, and Major Hay Beith. Subscriptions may be sent to, and will be gratefully acknowledged by the Hon. Secretary, the "Sir Alfred Fripp" Memorial Fund, 145, Cheapside, London, E.C.2. Major Beith writes: "Two characteristic donations have already been received by us—a cheque for £1000 from those truly practical philanthropists, the Froth Blowers, and a sum of 10*s.* raised by farthings among the children of a County Council school in one of the poorest districts of London." The total sum subscribed will be handed intact to the Governors of Guy's Hospital, an institution, as our readers know, with which Sir Alfred was closely associated as a student, surgeon, and governor for over 40 years.

VITAMIN DEFICIENCY AND ANÆMIA OF PREGNANCY IN INDIA.

AN anæmia of pregnancy is common in India among all communities except the European. The blood picture closely resembles that of pernicious anæmia, and treatment with liver extract is often successful. If untreated the disease is frequently fatal or there may be recovery after delivery. The anæmia is differentiated from true pernicious anæmia by this occurrence of spontaneous recovery and by the rarity of achlorhydria, regarded as an invariable concomitant of true pernicious anæmia. The condition has received a good deal of attention without any light being thrown upon its ætiology so far. A new study, however, has been made by L. Wills and M. M. Mehta, working under the auspices of the Indian Research Fund Association for the Maternal Mortality Inquiry, and they offer some interesting suggestions in the course of a preliminary report.[1] Their first important contribution is the recognition that the disease is not essentially an anæmia of pregnancy, but widely affects women throughout the population. It is only exacerbated by the exigency of pregnancy. Hearsay evidence is quoted that it is even common also among men. The wide prevalence of the condition and the equally wide prevalence of poor nourishment, deficient both in quantity and quality, readily suggest the likelihood that an association between the two is of fundamental importance in ætiology. The report is only a preliminary one, chiefly occupied with the accurate definition of the clinical entity; the dietary evidence is, therefore, not given, but the low content in both vitamins A and C of the majority of the diets is pointed out and is deemed to be significant. Apparently, none of the classical symptoms of vitamin A deficiency or of scurvy is observed, and the deficiencies, therefore, must belong to the latent type, whose importance is being only slowly recognised, probably because prevention or cure by the specific vitamin affords the only means of clinching the diagnosis.

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[2] Wood, W. Burton, and Gloyne, S. Roodhouse: THE LANCET, March 1st, p. 445.

[3] Valley-Radot, P., Dalsace, J., Nemours-Auguste, and Dérot, M.: Presse Méd., March 19th, p. 385.

[1] Wills, L., and Mehta, M. M.: Ind. Jour. Med. Res., 1930, xvii., 777.

ELEMENTARY KNOWLEDGE OF MALARIA.

THE main facts about malaria can hardly be too generally known among laymen, and a second edition of a pamphlet taken from Sir Ronald Ross's book on the "Prevention of Malaria" is accordingly welcome.[1] It is simply and clearly written and deals first with the parasites, the fever, and the way in which its varying periodicity is produced, and the main complications to which it may give rise. In referring among these to miscarriage, it is stated that while malaria may cause this quinine will not. It does not, however, appear advisable to seem to suggest that a pregnant woman should take quinine, except under medical supervision, unless this is not available. The description given of the mosquito cycle and of the mode of infection of man will be readily understood by one without medical training, though another edition might make it clearer that human and bird malaria are different and are not both carried by anopheles. The general importance of the house as the ordinary place where infection is acquired is emphasised, and it is advised that there should be reluctance to occupy an infected house without fumigation. The means of effecting this are carefully described as well as other methods of personal protection from mosquito bites. The life-history of these insects in its bearing on the transmission of malaria is adequately sketched, as well as the data by which culex, aëdes, and anopheles can ordinarily be recognised in their different stages. The avoidance by the householder of the careless provision of anopheline breeding places receives due attention. Under public prevention, it is pointed out that malaria probably causes a quarter or more of the sickness in the tropics and that the cost of public works for its suppression is likely to be more than recouped by saving in life, labour, invaliding, medical attendance, and hospital accommodation; and that a campaign which effects this will remove mosquito-borne diseases other than malaria, and will improve general sanitation.

BLEEDING AND THIRST.

IT is the custom in most hospitals to press upon a donor from whom blood has been taken a large cup of tea; in a minority of institutions beer is offered as an option; in some plain water only is provided. Except when faintness comes on in the course of withdrawal of blood donors seldom complain of thirst, but it seems only reasonable to provide as soon as possible fluid to take the place of that lost. There is a widespread idea that hæmorrhage gives rise to thirst and that this feeling is a teleological phenomenon designed to induce the organism to make up for the lost fluid. Probably a good many donors thankfully accept the proffered fluid because they feel that after losing a pint or so of blood they ought to be thirsty. Working with animals on whom such considerations can have no effect two French investigators[2] have been unable to find evidence that extensive hæmorrhage gives rise to any particular feeling of thirst. The animals used were horses which in the course of routine work in the preparation of therapeutic sera were bled to the extent of six litres daily for a variable number of days. They were watered in the morning before and in the evening after the withdrawal of blood. On averaging the results of observation of the fluid intake of 72 horses it was found that whereas on the days on which they were bled the intake of water was about 25 litres, on the other days it fell below this figure to the extent of only about one litre and a half, and this in spite of the fact that six litres of blood had been withdrawn. There was, moreover, no tendency for any excessive intake of water in the evenings after the bleedings. In one horse which was bled on 11 days, the evening intake of water after the bleedings was consistently less than the morning intake. The thirst following upon hæmorrhage associated with severe traumatism has long been recognised as one of the major terrors of the battlefield, but it seems probable that this thirst is due rather to the fever following upon wound infection than to loss of blood. The reserves of water in the body are by no means confined to the blood, and it would appear that they are so well conserved that it is almost impossible to seriously deplete them by withdrawal of blood to any extent that the organism can stand. In the horses used in the investigation described above no measurement of the urinary excretion of water was made; had this been done it would probably have revealed a considerable diminution following on the bleedings.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 15TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 433 (last week 393); scarlet fever, 2509; diphtheria, 1704; enteric fever, 46; pneumonia, 1730; puerperal fever, 51; puerperal pyrexia, 101; cerebro-spinal fever, 19; acute poliomyelitis, 6; acute polio-encephalitis, 1: encephalitis lethargica, 14; continued fever, 1; dysentery, 6; ophthalmia neonatorum, 127. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on March 18th–19th was as follows:—Small-pox, 687 under treatment, 26 under observation (last week 594 and 26 respectively); scarlet fever, 2132; diphtheria, 2712; enteric fever, 18; measles, 1043; whooping-cough, 81; puerperal fever, 32 (plus 4 babies); encephalitis lethargica, 123; poliomyelitis, 1; "other diseases," 28. At St. Margaret's Hospital there were 9 babies (plus 4 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns including London, there was 1 death from small-pox, 2 (0) from enteric fever, 165 (66) from measles, 14 (6) from scarlet fever, 35 (5) from whooping-cough, 43 (14) from diphtheria, 50 (11) from diarrhœa and enteritis under two years, and 85 (13) from influenza. The figures in parentheses are those for London itself.

The fatal case of small-pox was assigned to Shoreditch (Met. Boro.). Deaths from enteric fever outside London were reported from East Ham and Birmingham. Fatal cases of measles were concentrated at Manchester, 12; Sheffield, 10; West Ham and Portsmouth, each 8. (Glasgow also reported 23 deaths.) Whooping-cough claimed 3 victims each at Birmingham and Liverpool. Four deaths from diphtheria were reported at Liverpool, 3 each at Birmingham and Sheffield. The highest figures for deaths attributed to influenza were Portsmouth 5, Birmingham and Manchester each 4.

The number of stillbirths notified during the week was 295 (corresponding to a rate of 42 per 1000 births), including 60 in London.

LONDON HOMŒOPATHIC HOSPITAL.—Last year this hospital, which then completed 80 years' work, received 1712 in-patients; the out-patients' attendances exceeded 56,000. The Hospital Saving Association sent 401 in-patients and 2071 out-patients, for whom £3375 was paid.

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[1] A Summary of Facts regarding Malaria. By Sir Ronald Ross and Sir Malcolm Watson. 1930. London: John Murray. Pp. 15. 6d.

[2] Le Soif après le Saignée, Brocq-Rousseu and G. Roussel, Le Sang, 1929, i., 44.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

LXVI.—THE SIGNIFICANCE AND VALUE OF EXAMINATIONS OF MILK.

PART II.*

Pasteurised Milk.

A MOST important grade of milk is that defined as pasteurised. The term pasteurisation, in connexion with milk, has been used very loosely to apply to all methods of heating milk so long as the temperature does not reach boiling point. Quite commonly it has been applied without qualification to what is called "flash" pasteurisation, by which process milk is heated to a temperature from 160° to 175° F. for a few seconds. This treatment certainly destroys a large proportion of the bacteria in the milk, and therefore improves its keeping qualities, but the treatment does not destroy the most important infecting agent to be found in a certain proportion of the milk supplies—namely, the bacillus of tuberculosis. Besides, unless carried out with care, it somewhat damages the commercial quality of the milk by interfering with the cream-line and by imparting a cooked flavour if the temperature is allowed to get near to 180° F. By the Milk (Special Designations) Order pasteurised milk is specifically required to be retained in a temperature of not less than 145° and not more than 150° F. for at least half an hour, and be immediately cooled to a temperature of not more than 55° F. This method of pasteurisation has been alluded to as the "positive holder" method, because the milk is positively retained for a definite length of time, as distinct from the "flash" method alluded to. In speaking of pasteurised milk and its qualities, it is desirable to use the term in relation to the treatment of milk as thus specifically defined by the Order of the Ministry of Health. When milk is sold as pasteurised it must not contain more than 100,000 live bacteria per c.cm. It need not be bottled, but the vessel in which it is contained must bear a suitable label with the words "pasteurised milk." Although not sold as such, over 80 per cent. of the milk sold in the Metropolitan area of London is pasteurised. A large proportion of the milk sold in the large provincial towns is also similarly treated.

It has been shown conclusively that when milk has been pasteurised by the method as defined, there is an almost complete security against infection from the tubercle bacillus, in fact, the security is as great as, if not greater than, with Certified or Grade A (T.T.) milk. At the same time there is a protection from other pathogenic organisms which may gain access.

It has been contended that pasteurisation alters the character of the milk, but while this contention might be applied to milk treated by the "flash" method, it does not apply to the method defined by the Order. By the latter method the chemical changes are negligible, and the only vitamin that may be reduced is the antiscorbutic or C-vitamin. The amount of this vitamin in milk is very small, however, and its loss can be readily met by the administration of a small amount of orange juice to young children who may have to subsist almost entirely on pasteurised milk.

Grade A Pasteurised.—The only other grade of milk included in the Milk (Special Designations) Order is Grade A pasteurised, which is Grade A or Grade A (T.T.) milk which has been submitted to pasteurisation and which, after treatment, must not contain more than 30,000 bacteria per c.cm., and should have no coliform bacteria in 1/10 c.cm. This is a grade which is really not required. The chief quality of Grade A milk surely is dependent on its raw character, and after pasteurisation there is little to choose between Grade A pasteurised and pasteurised milk.

All these grades of milk, their production and sale, are kept under close supervision by the Ministry of Health and the local authorities named in the Order. There is, therefore, a real guarantee that they comply with the requirements set out. The medical officer of health can always be depended upon to give information to medical men regarding graded milk and regarding the particular quality of any milk supplied in his district.

Milk-borne Infection.

As is well known, many serious outbreaks of infectious disease, such as typhoid fever, diphtheria, and scarlet fever, and of sore-throat have been recorded as having been caused by milk. The recent occurrence of many cases of illness at Brighton is a striking example of milk infection. Their milk-borne character, however, is proved, not by the discovery in the milk of infective organisms, but by the incidence of the cases and by the special features of the outbreak. The evidence in the very few cases in which the bacteria of typhoid fever and diphtheria have been reported to have been found in milk is not conclusive. When one considers the numerous bacteria commonly found in milk and the small amount of infection that may gain admission, the difficulty of isolating the specific infecting agent can be imagined.

The search for pathogenic organisms in market milk is complicated by the fact that many types of organisms are encountered in making a bacteriological examination. Over 160 different organisms have been isolated from milk and identified by cultural and other characteristics. Even the members of the coliform group are numerous. Contrary to the popular view, milk drawn from the udder with aseptic precautions is not sterile, but contains a varying number of bacteria, being greatest in the fore-milk, in which there may be thousands, and smallest in the strippings, in which there may only be three or four per c.cm. The bacteria obtained from the inside of the normal udder are coccal in form. Where there is mastitis streptococci may appear in large numbers. To isolate the streptococcus of mastitis or Bang's bacillus of contagious abortion from milk directly drawn from the udder of an affected animal is a comparatively easy matter. In the course of ordinary milking operations many forms of bacteria are added from the air, from dirt or fæces falling from the outside of the udder, and from the milk vessels. It is from the particles of fæces and from the imperfectly sterilised milk vessels that the coliform bacilli are usually added. During transport from the cowshed to the consumer the milk receives varied additions of bacteria unless careful precautions are taken to exclude contamination by the use of sealed bottles or proper churns.

The recognition during recent years, in different countries, of cases of undulant fever associated with the consumption of milk has evoked much interest. Although Bang's bacillus has not been isolated from the incriminated market milk, there can be no doubt after weighing all the evidence in individual cases, regarding its bovine origin and its pathogenic influence in causing fever in the human subject.

Milk-borne Tuberculosis.

The most important milk-borne disease undoubtedly is tuberculosis, and therefore it deserves most consideration. It is difficult to state with any degree of accuracy what percentage of cases of tuberculosis is of bovine origin, but the following table, compiled by

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* Part I. appeared last week.

Dr. A. S. Griffith, represents results obtained by him up to the end of 1927 :—

Cases of tuberculosis.	Children—				Persons 15 years and over.	
	under 5 years.		5–15 years.			
	H.	B.	H.	B.	H.	B.
1280	167	114	442	167	379	25

H. = human ; B. = bovine.

Bovine tuberculosis thus forms a much large proportion of the tuberculosis found in children unde 5 years of age than in those between 5–15 years, while in persons 15 years and over the percentage of the bovine type of infection is very small. These are significant figures, indicating as they do the greater prevalence of the bovine type of tubercle amongst those members of the community who consume most milk. Somewhat similar figures have been put forward by other observers. Taking all the evidence relating to bovine infection of the human subject, Dr. W. G. Savage, in his book, "The Prevention of Human Tuberculosis of Bovine Origin," states :—

> "The position can be summed up by saying that, while the tubercle bacillus of bovine origin is probably not responsible for more than about 5 per cent. of the total tuberculosis mortality, yet this proportion is considerable, and its continuance is not creditable to our public health administration."

The percentage of milk supplies infected with tubercle bacilli varies greatly in different towns, but it may be accepted that the average is about 6·5 per cent. This figure relates to unselected samples of milk as delivered at the town and not treated by any heating or pasteurising process. The number of cows with tuberculosis of the udder used to be estimated by competent observers as about 2 per cent., but Savage, as a result of recent figures, has shown that the percentage with clinically detectable tuberculosis of the udder in unselected herds is about 0·2 to 0·3.

The detection of the tubercle bacillus in milk is not an easy matter. Methods have been suggested at various times by which the tubercle bacilli can be detected by microscopic examination. In these methods some form of concentration or centrifugalisation of the bacteria in the milk has predominated, followed by the making and staining of films made from the deposit. With the Ziehl-Neelsen stain the appearance of the tubercle bacillus is quite characteristic under the microscope. But these methods have proved untrustworthy, and the only process that can be depended upon is by the injection of the suspected milk into guinea-pigs. This is carried out by centrifugalising about 10 to 40 c.cm. of milk and then injecting the deposit subcutaneously into the inner side of the thigh of a guinea-pig. Three weeks must elapse before the guinea-pig is killed and examined for evidence of tuberculosis. The great drawback is that if the milk is infected, much damage can be done in the meantime to young persons ingesting it owing to the delay in completing the examination.

The health authorities of most large towns regularly take samples of milk to be tested by animal inoculation for the presence of tubercle bacilli. Infected supplies produced within the area of a county borough are investigated by the county borough council, and steps are taken to discover the offending animal and have it destroyed ; those produced elsewhere are reported to the council of the county in which the farm is situated and similar action is taken, the results of which are reported to the council of the district where the infected milk is being sold.

Under the Tuberculosis Orders the farmer is supposed to notify any cow which is, or appears to be, suffering from tuberculosis of the udder or from indurated or other chronic disease of the udder, but before this condition is recognised by the farmer there may have been much damage done, since the affection may only be recognisable by him when it is in an advanced condition. Regular examinations of milking herds by veterinary inspectors, as carried out in some counties, is therefore called for as a first step in the early detection of infective animals and in the elimination of tuberculosis from the dairy herds of the country. This would bring about the disappearance of all the most active cases of the disease, and if this procedure were followed by the tuberculin testing of all stock, a good deal of progress could be made in getting tuberculosis-free herds. A comprehensive and bold scheme is urgently needed.

THOMAS ORR, M.D., D.Sc.,
Medical Officer of Health and School Medical Officer, Ealing.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. B. R. Bickford is placed on the retd. list, with rank of Surg. Capt.

Surg. Lts. (D) to be Surg. Lt.-Comdrs. (D) : O. J. Barrable, E. R. Longhurst, H. N. V. Barnes, D. H. le Marchant, and D. L. Simpson.

The following appointments are notified : Surg. Comdrs. H. L. Douglas to Royal Naval Hospital, Yarmouth, and A. T. Rivers to *President*.

ROYAL ARMY MEDICAL CORPS.

Maj.-Gen. J. S. Gallie, late R.A.M.C., having attained the age for compulsory retirement, is placed on retd. pay.

Col. J. A. Hartigan, late R.A.M.C., to be Maj.-Gen., vice Maj.-Gen. J. S. Gallie, to retd. pay.

Lt.-Col. E. W. Powell, from R.A.M.C., to be Col., vice Col. J. A. Hartigan.

Col. O. M. Harris, on ceasing to be empld., is placed on half pay.

Lt.-Col. E. M. Pennefather retires on retd. pay.

Temp. Lt.-Col. C. F. White to be Lt.-Col., vice Lt.-Col. E. M. Pennefather.

Temp. Lt.-Col. F. C. Sampson to be Lt.-Col., vice Lt.-Col. E. W. Powell.

Majs. H. E. Priestley and J. S. Dunne to be temp. Lt.-Cols.

Maj. R. B. Price, from the secd. list, is restd. to the estabt.

Lt. W. F. L. Hannay resigns his commn.

TERRITORIAL ARMY.

Lt. W. L. Lamb (from T.A. Res. of Off., R.A.M.C.) to be Lt.

Lt. M. R. Coolican to be Capt.

D. G. Robinson to be Lt.

ROYAL AIR FORCE.

Group Capt. H. Cooper is appointed Honorary Surgeon to the King.

Air Vice-Marshal David Munro relinquishes his appointment as Honorary Surgeon to the King on retirement from the Royal Air Force.

Flight Lt. J. F. McGovern is granted a permanent commission in this rank.

INDIAN MEDICAL SERVICE.

Majs. to be Lt.-Cols. : F. J. Kolapore, E. G. Kennedy, J. V. Macdonald, H. A. H. Robson, C. G. Howlett, C. Newton-Davis, R. C. Clifford, C. Newcomb, H. E. Shortt; T. A. Hughes, H. L. Batra, D. McN. Taylor, and W. O. Walker.

AUXILIARY ROYAL ARMY MEDICAL CORPS FUNDS.

The annual meeting of the members of the Auxiliary R.A.M.C. Funds will be held at 2.30 P.M. on Friday, April 11th, at 11, Chandos-street, Cavendish-square, W. 1, when the annual report and financial statement for the year ended Dec. 31st, 1929, will be presented, and the officers and committee for the current year elected.

THE Food Education Society (29, Gordon-square, London, W.C. 1) has issued a leaflet entitled Bread and Its Place in Diet. This is obtainable for 1½d., post free.

CROTCH v. MILES.

ACTION FOR ALLEGED NEGLIGENCE IN THE KING'S BENCH DIVISION.

THE hearing of this case before the Lord Chief Justice and a special jury was continued on Tuesday morning, March 18th.

Mrs. MARTHA HARRIET GORDON CROTCH, of "Auntie's Tea Shop," Place Peyra, Vence, near Nice, alleged that Mr. WILLIAM ERNEST MILES, of 14, Park-crescent, W. 1, after performing on her the operation of sub-total hysterectomy for a large fibroid tumour, *left in the abdomen a pair of* 6-inch Spencer-Wells forceps, which were only discovered at an X ray examination made eight years afterwards. The Defendant denied that he left the forceps in her body, or that they were left in through any negligence or want of skill on his part or on that of any person for whom he was responsible. He also pleaded that the claim was barred by the Statute of Limitations, 1623.

MR. MILES'S EVIDENCE—(*continued*).

Questioned by Mr. RAYNER GODDARD, K.C., Mr. Miles said that four of five years ago he had replaced all his instruments by similar ones made of stainless steel. His housekeeper, Miss Doris Ruddock, had placed the old ones in a cardboard box—as they were condemned instruments—and they had been there ever since. He produced the six pairs of Spencer-Wells forceps which he had used in the operation on Mrs. Crotch. They were, he said, marked S I H; the S was near the screw, the I below it, and the H below that. The letters stood for the Holborn Surgical Instrument Company. He had bought these six pairs of forceps from the makers in—as far as he could recollect—1899 or 1900, since when they had been in constant use until he has discarded them for stainless steel ones. Asked to inspect the pair that had been extracted from the body of Mrs. Crotch, he said that it bore an H about a quarter of an inch below the screw, and about a quarter of an inch from the exact position where the S was on one of the forceps he had produced. The letters S I H appeared in the same order on each of his six pairs.

The forceps in question, with a pair of those produced by Mr. Miles, were handed to the jury.

Every surgeon, said Mr. Miles, used Spencer-Wells forceps, which were made in two sizes. Replying to Mr. Rayner Goddard, he said that he had served in the war for nearly five years. Thousands of Spencer-Wells forceps had been used in France during the war.

Mr. RAYNER GODDARD: Assuming that these forceps had been left in a person's intestine for eight years; is the state of corrosion such as you would expect after eight years' loss?—On looking at these forceps I see plating, and I cannot conceive that a pair of forceps would remain for any length of time and the plating be still there. I can produce a witness.

We will produce a witness with actual experience. Do you think that the plating could be visible on the forceps after eight years?—I should not say so, although I have no actual experience.

THE LORD CHIEF JUSTICE. What is the ordinary purpose for which an instrument like this forceps is used?—For picking up small vessels. When you have made an incision, and a small artery or vein or even a larger artery is squirting, it is nipped with the point of the forceps, so, and tied off. I do the tying except when it is rather awkward. If it is awkward my assistant holds the forceps and I tie, after which he takes the forceps off. If it is more convenient for him to tie, he ties and I take them off.

To a person who is not a surgeon an instrument like that looks like a pair of scissors, and a pair of scissors is an instrument with which you cut and which you then put aside. Those instruments, as I understand it, are used to be put in position and to remain in position?—No, if your Lordship means that they remain indefinitely.

No, to remain in an appreciable time to prevent bleeding—They could remain there until you occluded the vessel by a ligature.

You apply the forceps and leave it to stay the bleeding at the bleeding point?—Precisely.

Cross-examined by MR. J. W. MORRIS.

As soon as these forceps arrived in this country after they had been extracted from Mrs. Crotch's body, you had every opportunity of examining them?—I had.

I think you first had an opportunity of examining them about a year ago or more?—Yes; somewhere about that.

These forceps are undoubtedly Spencer-Wells forceps?—Without doubt.

And without doubt they are 5-inch Spencer-Wells forceps?—I agree.

And without doubt they are forceps which have a screw?—Yes.

That is quite a distinct kind from the kind in which the two limbs are detachable?—Yes.

When you first saw the forceps you saw on them the letter H?—No, I did not.

When did you first see the letter H on them?—I saw it when I went down with Mr. Hempson to the Plaintiff's solicitors; there was one of the assistants of the Holborn Surgical Instrument Company there, and he scraped the forceps—with their permission—and then I saw it. That was the second time, and not so very long ago.

You do not for a moment deny that those forceps are of the type you used in 1920?—Certainly; they are of that type.

Are those forceps that were extracted your forceps?—I have no means of identifying them or of saying whether they are.

You cannot deny on your oath that those are your forceps?—These forceps have an H on them. I have no forceps that have an H on them only.

Do you prefer not to answer the question, Mr. Miles? You cannot deny on oath, can you, that those are your forceps?—I think I can.

Did you use those forceps in the operation on Mrs. Crotch in 1920?—I cannot possibly say, because I do not know.

Did you leave those forceps in Mrs. Crotch's body after the operation?—I do not know.

Do I understand that the forceps which you have produced this morning, and a pair of which you have there, were bought in 1899?—In 1899 or 1900, I should imagine.

When did you buy this particular one which I have in my hand?—I do not know which one of the six you have.

Were they bought at different times then?—I bought twelve forceps somewhere about that time.

But I have in my hand one of the six you referred to this morning?—Yes.

You say you bought twelve; when?—Somewhere about 1899, 1900, or may be 1901; I do not know.

You bought them from whom?—The Holborn Surgical Instrument Company.

What was the next occasion when you bought some 5-inch Spencer-Wells?—I never got any more 5-inch Spencer-Wells forceps.

Until the time you told us of this morning?—I bought in 1896 twelve pressure forceps from Arnold's; they were detachable forceps. I bought these six from the Holborn Surgical Instrument Company.

What do the letters "H I S," in that order, stand for?—I suppose the Holborn Surgical Instrument Company.

THE LORD CHIEF JUSTICE: At the time of the operation, how many of these instruments had you in your possession?—I had about twelve small pressure forceps.

All Spencer-Wells?—They were Spencer-Wells.

Of those twelve, I understand that you have produced six?—These six were in my special abdominal bag.

Where were the other six ?—I have got them.

You have got all twelve ?—Yes, but the others are not all by the Holborn Surgical Instrument Company. When I was serving in France, commanding No. 7 Red Cross Hospital, I used some of my own instruments. I handed them into the Quartermaster's stores, and when the hospital disbanded, I received six instruments in return, but any six that they produced ; some were Allen and Hanburys, some Arnold's.

But when you say that on Nov. 27th, 1920, you had twelve small pressure forceps, do you mean that they were twelve which you yourself had got from the Holborn Surgical Instrument Company ?—No, my Lord, I did not say that they came from the Holborn Surgical Instrument Company, because I bought twelve and took six out with me to France in 1914.

Are you in a position to say how many small pressure forceps of the Spencer-Wells type which you yourself had bought from the Holborn Surgical Instrument Company you had in your possession on Nov. 27th, 1920 ?—I had got these six, and I have got two which are unmarked, but which seemed to be Holborn Surgical Instrument Company's forceps, but there is no mark on them ; that is possibly because they were replated.

Mr. MORRIS. In answer to my Lord as to the number of forceps you had on Nov. 27th, 1920, you said "I had about twelve pressure forceps."—Yes.

Can you tell us precisely how many you had ?—I have got twelve now.

That is not the question, Mr. Miles. You were asked by my Lord how many pressure forceps you had on Nov. 27th, 1920, the date of this operation, and you made answer "I had about twelve."—Well, there are twelve.

How many precisely did you have ?—Twelve.

Why did you say "about twelve"?—That may have been just an expression. I say now : "twelve."

Did you tell us that you were accustomed to great precision in these matters because you deal in multiples of three ? Why did you say to my Lord "about twelve"?—What I probably should have said was "twelve."

I understand that you told my Lord in answer to a question that you have other forceps besides these six brought here this morning.

THE LORD CHIEF JUSTICE. You say—I may have misunderstood or misheard you—but I understood you to say : "Four or five years ago I substituted stainless steel instruments for those I was using ; I put the abdominal instruments into a special abdominal case, and Miss Ruddock put the old ones away in a cardboard box. I produce the instruments I was using at the time of the operation on the plaintiff, all six of them."—All six, together with the other ones of different types.

Are you in a position to account for and to produce all the surgical instruments of this nature—the Spencer-Wells forceps—which you had in November, 1920 ?—Yes.

At any rate they are not here ?—I have only got the six.

Mr. MORRIS. I understand, Mr. Miles, you referred to two others which you mentioned specifically. What were those two ?—The two that have no mark on them, but are identical in shape and form with those forceps, and the probabilities are that the lettering was obliterated when they were replated. Miss Ruddock will tell you that I used to send my instruments to be replated when necessary.

Where were those two bought ?—They were probably bought from the Holborn Surgical Instrument Company.

Probably ?—Because they have no mark on them I cannot say.

Where did you get them replated ?—At the Holborn Surgical Instrument Company.

And when they are replated, is the whole of the first plating taken off ?—I could not tell you. I do not know what process they use.

Do they come back with no mark on them ?—I could not tell you that.

How often do you send them to be replated ?—An instrument may last several years, and sometimes the plating will chip off the first time you use it. That is why I have stainless steel.

How long does it take to replate ?—I do not know.

But you know how long they were away from you ?—I generally send them away when I am on my holiday. That is a convenient time.

Mr. Miles stated that he had never bought forceps from either Allen and Hanburys or Arnold's.

Mr. MORRIS. What do the letters H I and S in that order mean ?—I cannot tell you. Holborn Surgical Instrument Company ?

That would be H S I, wouldn't it ?—I do not know ; I am not responsible for putting those letters on the instrument.

What does the letter H stand for ?—I should imagine, Holborn.

Was that forceps in front of you which was extracted from Mrs. Crotch's body made by the Holborn Surgical Instrument Company ?—Apparently, because it has got an H on it.

The company from whom you bought your instruments ?—Yes, but when I bought mine they did not mark them with an H only.

Have these in my hand been replated ?—I could not tell you.

Have the six you referred to this morning been replated ?—I could not possibly tell you.

Have you any records of dates when you bought these instruments and sent instruments to be replated ?—No, I cannot possibly remember, but I know that I bought these instruments early in my career and I have been practising for thirty years.

Mr. Morris put further questions about the instruments which Mr. Miles had taken to the war and those he had brought back ; Mr. Miles admitted that he could not remember exactly how many Spencer-Wells forceps he had taken out to the war, but he knew that he had left six Holborn Surgical Instrument Company forceps behind in his abdominal bag. No stock or inventory had ever been taken of his instruments.

Mr. MORRIS. You have heard, have you not, of the precise spot from which the forceps were extracted by the French doctors ?—Yes.

And you have seen the X ray photographs ?—Yes.

Were the forceps underneath the place where you operated in 1920 ?—I do not understand that question. I saw the place where the French surgeon marked on the diagram (an instructional model, put into Court) the spot from which he said he had removed those forceps. I say that he drew them longitudinally in the middle line ; those forceps were shown not to be longitudinal in the middle line by the X ray, and the X rays do not lie.

Mr. Miles then identified the anatomical parts on a similar model.

Mr. MORRIS. There is no doubt, is there, that the operation for the removal of the gall-bladder is one that entails an incision above the umbilicus ?—Yes.

And that for your operation of sub-total hysterectomy your incision was below the umbilicus ?—Yes, what we call a sub-umbilical laparotomy incision.

And your incision was down the median-line ?—Absolutely in the middle line from the umbilicus to the symphysis pubis.

Is the place where these forceps are marked in ink on this model approximately underneath the line of your incision ?—In the place where he has put them, it would be, but that is not where they are shown in the X ray.

THE LORD CHIEF JUSTICE. You heard the evidence read on the last day—it was taken in France—and you know what was said of the place where the forceps was found in the body ?—It was in the "*petit bassin*," I think, my Lord.

Suppose that that forceps had been used for th purposes of the operation of removing the gall-bl the incision for that purpose having been made i ordinary place for that purpose and that the had then by inadvertence been left in : was it p possible for the instrument to travel down where it was shown?—I think so, by the force of gravity. Moreover, there is another point. Supposing that a pair of forceps had been left in in that position and had descended by the force of gravity, the greatest resistance to the descent would be offered by the rings. The position shown in the X ray is perfectly consistent, in my opinion, with their having travelled down.

Mr. MORRIS. For how long after an operation for removal of the gall-bladder would a patient be flat on her back?—It depends upon the surgeon. I generally like to keep my patients in bed for three weeks after a big abdominal operation.

So that the force of gravity would be for three weeks a force quite different from the direction that you were indicating?—Possibly, but then I do not know that this patient was not put in a sitting-up position.

THE LORD CHIEF JUSTICE. You say that the drawing of the forceps is incorrect and does not tally with the X ray photograph?—That is precisely my contention, my Lord.

Assume that the X ray photograph correct and suppose that that forceps had by inadvertence been left in the Plaintiff's body at the time when you performed your operation in 1920; could the instrument afterwards have been found in the place shown by the X ray photograph?—I do not think so, because my operation was entirely confined to the true pelvis, which the French call *le petit bassin*.

Mr. Miles then gave a detailed anatomical description of the pelvis. He concluded—So if the round ligament had gone through the ring of the forceps, they would have been found at the level of the ilio-pectineal eminence instead of where they are shown in the X ray picture.

He then pointed out the discrepancy between the French surgeon's mark on the diagram representing the position of the forceps as estimated by him, and their position as shown by the radiogram.

Mr. Morris read the following questions from the evidence of the French practitioner, Dr. D. Maestracci:

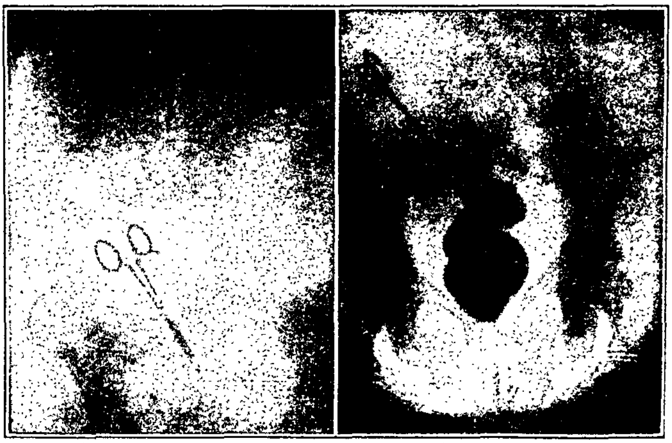
> Look at the two X ray photographs B and C; where do they show the forceps to be?—Inside the small pelvis on the right hand side.
>
> Where were the forceps with reference to the external laparotomy section?—On the right half of the scar, underneath.

Mr. MILES. That is anatomically wrong.

Mr. MORRIS. Do you dissent from either of those answers?—Absolutely, they are anatomically wrong. The man was talking nonsense. This is the small pelvis, further down; they would have been here (indicating a point several inches higher). Anatomically, he is talking absolute rubbish.

THE LORD CHIEF JUSTICE. The *petit bassin* is what you call the little pelvis?—Yes; the true pelvis in English anatomy. He says they are in the true pelvis, and he is wrong.

You mean that the X ray shows they were there (*indicating a higher point*)?—Yes; I have no other evidence. The X ray shows they were there, and the X ray shows their relation to the skeleton.



The two X ray photographs marked "B" and "C" in the depositions of witnesses examined at Nice and admitted in evidence during the hearing of the case *Crotch* v. *Miles*. They bear the legends:—(1) Mrs. Crotch: Radiographie de l'abdomen avant le lavement baryté (20.9.28); (2) Rapports du corps étranger avec la portion terminale du gros intestin (20.9.28). The interrupted line on the left-hand radiogram indicates the position of the incision made by Dr. Prat at the operation for the removal of the gall-bladder (see THE LANCET, March 22nd, p. 649).

Mr. MORRIS. You do not dispute that the forceps were found either inside the small intestine or in the folds of the small intestine?—I did not see them and did not take them out. I do not think they were in the small intestine.

You have no reason to doubt that they were at least in the folds of the small intestine?—Yes, they were in between the coils; I admit that.

THE LORD CHIEF JUSTICE. In between the coils but outside?—Yes, I am perfectly certain of that. (The witness illustrated how two surfaces of the peritoneum covering the small intestine might form an adhesion through a ring of the forceps. It was impossible, he said, that an adhesion could ever form between two parts of the mucosa lining the small intestine.)

Mr. MORRIS. Is it not a fact that bodies may work their way into the small intestine itself?—It has been known; I have known, for instance, of a swab ulcerating its way in.

How do you account for the presence of fæcal matter on those forceps?—I am not at all certain that it is fæcal matter. I should say it was an incrustation.

Supposing the French surgeons are right in saying that it is fæcal matter; how do you account for it?—If it is fæcal matter, probably the point of the forceps may have just perforated the bowel; that is just possible, but if it had been so, this patient would have contracted a very acute abscess with leakage, and the contents of the bowel would have been free to enter the abdominal cavity. When the forceps were removed, there would have been an enormous abscess cavity. That is why I do not think for a moment that the forceps were ever inside the intestine.

You have read the evidence of the French surgeon?—Yes, but that has no weight with me at all. I judge things on my own knowledge; I do not take anything that a Frenchman says or anyone else.

Do eminent medical men have differences of opinion when each thinks that the other is wrong?—Yes, but not on a question of anatomy.

You know that it is the view of French surgeons that forceps with a screw are not so sanitary as dismountable forceps?—Absolute nonsense of the worst type. It is easier to clean detachable forceps mechanically, but not to sterilise them. French surgeons can do what they like.

And British surgeons use screw forceps and not dismountable ones?—Certainly.

I understood you to say on Friday that the presence of forceps amongst the intestines would cause a swelling?—Naturally. You could not put that pair of forceps among intestines without it.

And the swelling caused by those forceps would cause the muscles or other covering to swell out?—Not the muscles. You would feel a tumour under them.

It would cause the muscles to bulge?—That is right.

If the muscles were bulging, would they bulge through the point in the abdominal wall where there was weakness?—Not necessarily, by any means.

Supposing an incision had been made in the abdominal wall, the line of that incision would not be as strong as the remainder of the wall ?—Very often much stronger, but in stout people, especially after a strong fit of coughing, some of the stitches may break away, or the wound may bulge a bit. Ventral hernia is therefore quite a common thing. No ventral hernia, however, is produced by a foreign body unless it has been driven through the abdominal wall as by shrapnel in the war.

Does the ventral hernia take place at some point on the line of the incision ?—Yes.

If you were explaining that to a layman, would a reasonable explanation be that the muscles had been displaced by the operation ?—No, I do not think so. I should say that the scar would have stretched.

If there were some swelling or foreign body which caused pressing, it would press one way towards the urinary bladder and the other way towards the rectum ?—If the foreign body were down in the pelvis it would, because the two organs are close together, but in this case it was not in the pelvis.

And if one of the symptoms in this case were urinary trouble—incontinence—might that have been caused by the presence of a foreign body ?—Not necessarily, because cystitis is a common thing, and you very often get coli bacilluria.

Might it have been so caused ?—I do not see how it could have been, unless the foreign body were absolutely pressing into the bladder.

And supposing it was absolutely pressing into the rectum ; might there be what one French surgeon has called tenesmus ?—Tenesmus is simple contraction caused by any irritating condition, such as colitis or rectitis.

Might it cause the trouble in defæcation ?—If you had a pair of forceps pressing on the rectum, of course it would, but the X rays show that they were not there.

Mr. Miles, in answer to a question, explained the anatomy of the abdominal viscera. In reply to the Lord Chief Justice, he said that in neither of the two operations was it ever necessary to open the intestine.

MR. MORRIS. You do not suggest, do you, that the leaving of a pair of forceps in a patient's body can in no case be due to the surgeon's negligence ?—I do not say it is due to negligence ; I say this : that one takes every possible care to prevent such a thing, because no one would willingly leave a pair of forceps in anyone's abdomen.

That is not quite an answer to the question. You do not suggest, do you, that, in any case in which a forceps is left in the patient's body, it is not due to negligence by the surgeon ?—I cannot conceive of negligence, because every endeavour is taken to remove any forceps that you use if you do put them in there. It may be accidental, but that is not negligence.

It may be that the leaving in of a pair of forceps in a given case is the grossest negligence ?—You can conceive that, but I do not consider that I have ever been negligent.

Might not the presence of a pair of forceps in the peritoneal cavity cause the gravest consequences, such as a complete puncture of the intestine ?—Certainly.

Might that cause fistula and death ?—I do not know about fistula, but it might cause an abscess.

It might cause peritonitis ?—If it were septic, yes.

You will agree with me that a surgeon ought to do everything that is humanly possible to avoid such grave consequences ?—Certainly and absolutely.

And that, if the surgeon counts his instruments before an operation, and again when the operation is over, he has an infallible test ?—As near as you can humanly make it.

It is an infallible test if he only uses six Spencer-Wells forceps and has six before and six after ?—Yes.

I gather that in your practice you count them yourself ?—I always count my instruments when I take them and hand them over to the sister, and I always count them afterwards.

So, if these were your forceps, your system broke down ?—Yes, but I deny that these are my forceps.

You will agree that the removal of all instruments is a vital part of the operation and that if a surgeon leaves forceps in a body he has not finished his operation properly ?—Yes, but in an operation you are not dealing with a motor-car, where you can smoke your pipe and think about it. You must take your sister's word that the instruments are right. There is no getting away from that.

It is the practice of surgeons to keep a careful note of the details of an operation ?—No, never particular details.

Have you got any notes of this operation ?—No. I think that I must have made notes about it, but I have looked for them and cannot find them anywhere, though I have several notes of about the same date.

THE LORD CHIEF JUSTICE. This is one of the difficulties of trying a matter which is ten years old.

MR. MORRIS. Do not surgeons in fact keep their notes for anything up to twenty years ?—Yes, I could show you notes that I took in 1898 or 1899, but the notes of this case must have got lost when I moved.

Were there not other tumours which you had to remove in this case ?—No, but there was some inflammation of the left Fallopian tube and ovary; there were a great many adhesions which were evidence of a pre-existing peritonitis.

Did other medical men come to see the particular matters that had been removed from Mrs. Crotch ?—Only Dr. Wadd and Dr. Burn.

How many people were present at this operation ?—I cannot be quite certain, but Dr. Wadd assisted me, Dr. Burn gave the anæsthetic, and there was a theatre sister and, I believe, one other nurse.

Mr. Miles said he thought he had operated in a room fitted out as a theatre for the occasion. He had not known the name of the theatre sister or whether she was regularly employed by Dr. Wadd or not. In reply to the Lord Chief Justice, he said he thought he had worked with her before, as he had previously operated at the Hydro three or four times.

MR. MORRIS. You stated in your evidence in chief that you thought the theatre sister was competent ; on what did you base that answer ?—Dr. Wadd would say she was competent and would know she was competent, and as far as I can recollect she had been present at operations before. Moreover, it is generally possible to tell whether anyone is competent or not by the way in which they set about things.

When an operation starts you are in supreme control of everybody in the room ?—I am in control, yes. I do not interfere with people.

Are you in supreme control ?—I control them, but I cannot prevent them from saying and doing what they like. They are under my direction, but I do not understand the words "supreme control," because I cannot control anyone.

Is it within your power to tell a nurse to do a certain thing ?—Yes, I can ask her, certainly.

Can you tell her how she is to do a certain thing ?—I could, but I do not.

Supposing a nurse acted improperly during an operation, you have the power to turn her out of the room ?—Yes, I should object to her, certainly.

Is the credit for a successful operation not attributed to the surgeon ?—It generally is, but all the team get their due.

Mr. Morris read the passage from the judgment in Hillyer *v.* The Governors of St. Bartholomew's Hospital (2KB. 1909. 826) which deals with the responsibility of the surgeon for the actions of his assistants at an operation, and which held that they are under the sole orders of the surgeon. Mr. Miles concurred that this ruling conformed with sound surgical practice and agreed with the phrase "the surgeon is, for the time being, supreme."

THE LORD CHIEF JUSTICE. Of course the question there, Mr. Morris, was whether the governors of the hospital were liable for damages, and it was held that the operation staff were not the servants of the governors. But it does not follow the other way round, that the nurses assisting at the operation are the servants of the surgeon.

Mr. MILES. (To Witness.) I understand from your evidence in chief that you keep a superintendence over what the others are doing in the room?—You cannot look to see everything that the nurse does, but there is an instrument table at your right hand and it is possible to glance here and there. As for the anæsthetist, I can never see what he is doing, and I rely on him to tell me whether the patient is quite well.

How long did this operation take?—In my recollection, an hour or more.

Mr. Miles said that he had done sub-total hysterectomies in 25 minutes, but that this one had been very complicated. He admitted having used 5-inch Spencer-Wells forceps of the type which he had produced, in the first stages before the peritoneum was opened. Asked whether he had gone straight on to another operation, he said that he had not.

Mr. MORRIS. Suppose that during an operation you find that you have not enough instruments of a particular kind, what do you do?—I know what I am going to do and take the number that is necessary.

If a patient is big and stout, there might not be more than six bleeding points?—There might, but if there are you ligature them off and put the forceps on to the vessel you divide at the next cut. You do not divide right through and get all your bleeding at once.

Have you ever had occasion to send for more instruments other than those which you have taken out for the operation?—I do not remember ever having done so, except that in a case in hospital you may suddenly want a special instrument; it is then procured.

Would there be instruments available at the Hydro?—I suppose Dr. Wadd has some, but I always make a point of using my own if possible.

(Mr. Morris questioned Mr. Miles on one of the X ray photographs.)

There is no doubt that the forceps on that photograph are shown as being opened?—No doubt whatsoever.

There is no doubt, is there, that there was never occasion to have forceps in that part of the body lying open?—There was not. What the picture shows was that they were not attached to the bleeding point.

Mr. Miles described the process of screening off the intestines with towels clipped together by Lane's tissue forceps. It would, he said, be impossible to use Spencer-Wells forceps for this purpose.

Mr. MORRIS. I understand that one of the four towels in this particular operation would be below the pubis?—Yes, just across the symphysis pubis.

After you have made your incision and when you have clipped some of the bleeding points with Spencer-Wells, you ligature them off, and take off the Spencer-Wells?—Either I or my assistant does it.

You would put those Spencer-Wells down on one of the towels?—Not necessarily. Sometimes I should if a patient is lying flat. You can put it down there or on the table, and the sister may take it.

According to your evidence, you are going to use Spencer-Wells again in a few moments?—Yes.

And you want them near at hand?—Yes.

It is considered desirable, is it not, to avoid moving instruments about too much for fear of infection?—They must only be touched by people with sterile gloves.

You told us on Friday that an instrument may get lost in a towel?—Sometimes at the completion of an operation you may find that a towel has covered up a pair of scissors or dissecting-forceps.

One of those might slip into the wound when you are taking away the towel?—Oh, no, that is untenable, because one is attending to the process.

In what position was the patient?—Horizontal.

So the towel below the pubis would be quite horizontal to contain instruments which you wanted to put there?—Yes, it is between the thighs.

And I understand that an instrument may get lost in the towel?—It is on the surface; it will not get lost there.

At the end of the operation is it your duty to have a good look round the wound before you sew it up?—Yes, at the field of the operation, but one does not want to rummage round the patient's inside. Surgical technique is, moreover, a ritual, and does not admit of looseness of expression. You say have a "look round." The surgeon is doing something.

What, then, is the appropriate phrase?—A careful search. You have your own eyes and your assistant's and sometimes you would feel as far as you could.

Feel in the wound?—Yes, after a hysterectomy, when you have completed your operation and the wound is still held open by self-retaining retractors, the pelvis is as open to you as the interior of your hat. Part of the ritual of an operation on the abdomen is what we call the toilet of the peritoneum, for ensuring that no raw edges are left, and that everything is tucked away, and small bits of blood-clot removed. The hollow is completely empty.

Suppose that after an operation you discovered that you were one instrument short; what would you do?—If, after a search outside no one could find it?

Yes; if the absence of a forceps was not discovered until you had counted your instruments after the patient had been sewn up, and you had reason to believe that a pair of forceps had been left inside the body. Would it be your duty to inform the patient?—I should certainly take steps to find out if they were there. I should not inform the patient unless I knew that they were there.

You would take an X ray?—Yes, I certainly should.

Questioned about the visit of Mrs. Crotch in 1921, after the operation, Mr. Miles admitted that Mrs. Crotch's recollection was more likely to be accurate than his own.

Mr. MORRIS. Supposing Mrs. Crotch had asked you whether she had another tumour, it would have been correct, would it not, as the uterus had been removed, to say that there was nothing now to which a tumour might adhere?—No, I could not have said that, because she might have had a tumour from another condition.

Mr. GODDARD said that you could not have noticed anything or you would have communicated with Dr. Wadd?—Yes.

I understand that you did communicate with him?—I either telephoned to him or wrote to him.

But you have no recollection what you told him?—No. I probably told him that I had seen Mrs. Crotch, but I have no impression on my mind that she had anything which would lead me to think that she was in trouble.

If Mrs. Crotch had your assurance that that swelling was something that she need not worry about, there was no more that she could do?—I do not agree that I said she had a swelling.

You have heard Mrs. Crotch's evidence that for the whole of the eight years she had what she described as an agonising catch of pain?—Yes.

Is that acute pain consistent with the presence of a pair of forceps in the intestine?—I could not say. I have known many people with foreign bodies in their insides during the war, but I do not recollect any of them, unless they had an abscess, complaining of acute pain.

And her evidence that she had some measure of ease in lying down rather than walking about; is that consistent with the pressure of a pair of forceps?—There are many other things that might produce it. I have no experience of a patient with a pair of forceps inside him, but I have had experience of patients with bits of shrapnel five or six inches long, and have taken them out.

And these other troubles of which she has told us—the urinary incontinence, and so forth—are they consistent with the presence of forceps ?—There again I cannot tell you, because I have had no experience. A patient may have urinary and rectal symptoms from a variety of causes.

But amongst those causes would be the presence of a pair of forceps ?—I do not think so, unless they were absolutely pressing or ulcerating through the bladder or rectum.

Re-examined by MR. RAYNER GODDARD.

Mr. Miles said that forceps lying as shown in the X ray picture would not be pressing against or touching the bladder in any way.

In 1920, where did you keep your spare instruments, if you had any ?—I had a specially made box with three tiers like a suit-case, with one part which I could use as a steriliser.

Mr. Miles said that he had never used Spencer-Wells forceps for fixing towels. He had not performed another operation that day. He took his own nurses when he operated at a strange nursing home, but from his experience of Dr. Wadd's hydro he had not considered it necessary. Dr. Wadd was a very excellent surgeon, and he relied absolutely on his judgment.

MISS DORIS GERTRUDE RUDDOCK.

Examined by MR. RAYNER GODDARD.

Miss Ruddock said that she was housekeeper to Mr. Miles, and that between 1919 and 1924 she had been in charge of all his surgical instruments. He had had two instrument bags, one rectal and one abdominal, and instruments were never transferred from one to another.

MR. GODDARD. What were the instruments placed in as they were put in the bag ?—They were placed in two separate cubicles especially made for instruments.

Did you sterilise the instruments when Mr. Miles came back from an operation ?—Yes, always.

Did you count them ?—Yes.

In his presence or not ?—Yes, in his presence.

And when you had sterilised them, what did you do with them ?—I recounted them in Mr. Miles's presence and put them in the box again.

In 1919 and 1920, what Spencer-Wells forceps had Mr. Miles in his abdominal bag ?—He had six.

Miss Ruddock said that these were always the same six. There were no Spencer-Wells forceps in the rectal bag. She had never seen any other Spencer-Wells forceps in the flat in which they had lived at that time. Mr. Miles had had a case of instruments apart from the abdominal and rectal bag, but she could not say whether these other instruments had been kept at the flat or at the consulting-room, as she had been concerned only with the bags.

THE LORD CHIEF JUSTICE. Do you mean that, in addition to the contents of the bags, there was an instrument case where other instruments were ?—They were not at the flat.

But wherever they were, is that what you mean: that, apart from the contents of the two bags, there was somewhere an instrument case containing other instruments ?—Yes, but not at the flat.

Miss Ruddock stated in answer to Mr. Goddard that when Mr. Miles went out to an operation he used to say whether it was to be a rectal or an abdominal operation, and she used to lay the instruments out and he would count them with her, put them back into the tins, and shut the box. They would be the same instruments as had been used at the last operation and which she had sterilised and counted in his presence. She had never known him go out with either more or less than six Spencer-Wells forceps. He purchased a new set of stainless steel instruments at some time—about four years—after 1920. She had then placed all the old instruments in a box (produced) and put them away in a cupboard in the consulting-room at Park-crescent. She identified the six pairs of forceps which had been in the abdominal bag and said that she had never known him have any others in that bag. Since the cardboard box with the old steel instruments had been put away, she had never had occasion to go to it until 1928, when Mr. Miles had had a letter from the solicitors. The box had then contained the six Spencer-Wells forceps produced in Court, nine Lane, and six Kocher. This was the exact number that Mr. Miles had used in his abdominal bag. She had never had to do with any other forceps but these.

MR. GODDARD. How many needles and so forth did Mr. Miles have in his bag ?—He used to count the needles himself except a few needle-holders.

Yes, but how many other instruments were there in the tin ?—Three knives, three scissors, and six Moynihan clips.

THE LORD CHIEF JUSTICE. And those formed the contents of the abdominal bag ?—Yes, except, of course, the clamps; that is, one retractor and one clamp.

Cross-examined by MR. MORRIS.

The witness said that she had been with Mr. Miles since he had come back from the war. The instruments which he had brought back from the war had been in a case at Wimpole-street; she had not got them mixed up with any other instruments, as she was only looking after those in the abdominal and rectal bags. This case had been at Wimpole-street until it had been moved to the flat in 1924. It had been kept locked up. She did not work in fixed hours, and lived at the flat.

MR. MORRIS. If you were out and Mr. Miles came back from an operation, and if it is important to sterilise at once, he might do the sterilisation ?—I was never out when Mr. Miles went to an operation, in case there should be any messages for him. It is very seldom that I go out at all.

Mr. Miles might do his own sterilisation ?—He would not. I have never known him do it.

THE LORD CHIEF JUSTICE. What is the operation of sterilisation ? Does it take some time ?—It takes about three-quarters of an hour.

MR. MORRIS. And after the sterilisation you say that Mr. Miles always counts his instruments with you ?—Yes.

It must have happened sometimes that Mr. Miles was not there ?—Mr. Miles was always there. I never used to touch them unless Mr. Miles was there, and he never used to touch them unless I was there.

Who decided when instruments needed replating, you or Mr. Miles ?—If one needed replating, Mr. Miles would see it at the same time as I did.

And who would do the replating of it ?—The Holborn Surgical Instrument Co.

Who would send it there ?—I would take it there myself.

How often did it happen that Spencer-Wells were sent to be replated ?—It is hard to say, but they were not done more than six-monthly or yearly, and never unless Mr. Miles was on holiday and could afford to send them.

Do you remember anything about the marks on these instruments before they were replated ?—They had the same marks on as the original ones.

The witness stated that she had never had an inventory or written list of the Defendant's instruments but had been able to account for all of them in her head. There had been no Spencer-Wells in the rectal bag.

Re-examined by MR. GODDARD.

The witness said that she had that morning gone to Park-crescent and brought all the ordinary steel Spencer-Wells forceps that she could find. None of these had been at the flat or in the abdominal bag, but in the case at Wimpole-street, to which she had never had occasion to go. Inspecting these forceps, she said that three were marked Arnold, two Allen and Hanbury, and one H S I. These were the only other forceps in the possession of Mr. Miles.

In answer to Mr. Morris, Mr. Goddard said that this last envelope contained seven forceps in all.

Would not some form of inflammatory swelling be set up?—Yes, when the forceps perforated the bowel.

Would that inflammation tend to cause pressure against the rectum on one side and the bladder on the other?—Yes, if it were right down in the pelvis.

Might this cause the urinary trouble which the patient had complained of?—Yes.

Supposing that there was a foreign body actually in the small intestine, might there be some infection which would go upward and cause the metallic taste in the mouth which the patient described as like the taste of rusty nails?—That is very unlikely.

Could you tell me what would cause that persistent metallic taste?—There are certain medicines that cause it.

Might the presence of the forceps cause it?—I do not think so, I cannot see any connexion at all.

I understand that you can get an infection ascending from the bowels to the gall-bladder?—Yes.

That infection has an upward trend?—Yes, but that is an indirect infection of the gall-bladder. The organisms get in from the small bowel to the blood and then by the blood to the wall of the gall-bladder.

Sir Hugh said that he thought the stoutness of the patient did not affect the number of bleeding points in the early stage of the operation. If there were multiple tumours in the abdomen, there would be more bleeding points, which might sometimes be picked up by forceps of the kind in question. A surgeon often inspected the wound just before he closed it to see if any bleeding point had been left. Instruments were not often put on the patient but usually on the small tables fixed to the operating table, or standing by the surgeon.

Supposing you had ligatured a bleeding point and removed the pair of forceps and were going to use the forceps again in a moment, would you not put them down on one of the towels; for example, the towel which would be below the pubis in this operation?—You might.

Might there not be a number of instruments, a dozen or more lying about?—Yes.

Do you not agree that the counting of instruments is always only a means to an end, the end being to see that no instruments are left in the patient's body?—Yes.

I gather that there is nothing to prevent a surgeon from checking his instruments himself after the patient has been sewn up?—Nothing at all, after he has finished his operation.

And, unless the surgeon counts wrongly or is negligent in his counting, that test ought to be infallible?—It ought to be, but in practice it is impossible; it is not carried out.

THE LORD CHIEF JUSTICE. This Defendant says he did it. You say that the standard imposed in this case is a standard higher than the ordinary surgeon would be expected to observe?—Much higher.

Re-examined by MR. RAYNER GODDARD.

Sir Hugh Rigby said that he had heard Mr. Miles's evidence dealing with his own use of the aneurysm needle in the abdomen instead of forceps; that method was recognised as satisfactory, and there was then no necessity to use a Spencer-Wells. In reply to Mr. Morris, he said that the use of the aneurysm needle was not confined to larger blood-vessels, but was a matter of individual taste.

SIR THOMAS JEEVES HORDER.

Examined by MR. RAYNER GODDARD.

Sir Thomas said that he had known Mr. Miles as an operating surgeon for about 25 years, and that Mr. Miles had operated on a considerable number of his patients. The Defendant's methods were those of a careful surgeon. The witness himself attended at serious operations. He knew Mr. Miles to be very careful in his methods of checking his instruments; if he had not thought so he should not have nominated him to operate on his patients. Sir Thomas enumerated the persons who usually took part in a surgical operation. The duty of checking instruments, swabs, and sponges was laid upon the theatre sister.

Is the surgeon himself in your opinion able to do that?—I regard him as responsible for the sister's competence to do it, but I should not regard it as in the patient's interest that he himself should feel it necessary constantly to watch the instruments in the last stages of an operation.

THE LORD CHIEF JUSTICE. It is said that at the conclusion of an operation, after the patient has been sewn up, there may be a duty upon the surgeon to see that the count is correct, so that if it does not appear to be correct, the mischief can at once be attended to. What do you say to that?—I agree, my Lord; that is the surgeon's responsibility. I regard the surgeon as being ultimately responsible for all these matters.

MR. GODDARD. Is there any possible precaution that you can suggest beyond counting the instruments before and after the operation?—Assuming that the counting is done by a competent person, I cannot suggest any further precautions. That seems to have reduced things to the simplest and safest of terms.

THE LORD CHIEF JUSTICE. What would be your observations upon a surgeon who said, "Nobody counts the swabs and nobody counts the forceps?"—My Lord, I should not nominate that surgeon to operate upon my patients.

Sir Thomas said that after an abdominal operation there was always some pain, but not necessarily considerable pain. There was always some abdominal pain after a hysterectomy; in a normal case this pain continued for a few days, perhaps two weeks, depending upon the idiosyncracy of the particular patient. He had seen quite a number of cases of ventral hernia after abdominal operations. This was due to several factors, including the extent of the operation, the extent of the incision, and the personal idiosyncracy. Obesity and lack of muscular tone were great determining factors. This ventral hernia was not usually accompanied by pain, but pain might be present. He should not expect the presence of a pair of forceps in the abdomen to manifest itself by an external lump unless considerable inflammation and suppuration had occurred, and an abscess had formed. A lump could only be formed by an abscess.

MR. GODDARD. The Plaintiff has stated that from a very early stage, two or three months after the operation, a lump the size of a cocoanut appeared on her abdomen in the neighbourhood of the scar. Could that be caused by the presence of the forceps?—No.

The surgeon who operated in France for the gall-bladder trouble stated that the gall-bladder was very diseased and thickened and adherent to the surrounding parts. Would that condition be consistent with a sudden onset of gall-bladder trouble, or would it indicate a chronic state?—A chronic state with possibly acute complications, but it sounds as though it had been in existence for some years.

Patients might complain, Sir Thomas said, of gall-bladder pain in any part of the abdomen, if for no other reason than the associated flatulent dyspepsia. He described the cause of dysentery and said that gall-bladder infection was not a usual consequence. The presence of a pair of forceps in a fold of the intestines could not cause either gall-bladder trouble or dysentery. Judging by the symptoms as described to him by Mr. Goddard, he assumed that the forceps had not penetrated the small intestine.

Cross-examined by MR. MORRIS.

Sir Thomas Horder stated that it was impossible to say whether the adventitious matter on the forceps was fæcal matter or not. From its appearance it might be, but its nature would only be certain if a chemical analysis were made. He had had no experience of a case in which a pair of forceps had been left in the body.

A foreign body lying within the coils of the intestine might penetrate it. In answer to the Lord Chief Justice, he said that perforation was necessarily accompanied by irritation and ulceration. A foreign body would inevitably cause the formation round it of fibrous tissue, and adhesions were the result of inflammation. Blood in the fæces might be caused by the presence of a foreign body. An abscess might form around a foreign body even if it were sterile.

Mr. MORRIS: After the gall-bladder has been almost entirely removed, ought not the symptoms to disappear?—It is most desirable that they should, but they do not always do so. There is no "ought" about it.

If there were a persistence of some pain identical with pain that had been existing for a long time, would not the irresistible inference be that that pain was not one of the gall-bladder pains?—Not irresistible.

Would it be a most probable inference?—If, as I understand it was, the gall-bladder in this case was very grossly diseased. I should think it would be optimistic to expect a hundred per cent. freedom from discomfort after its removal.

Would it be a most probable thing for the persisting pain to discontinue?—I should hope persistent pain would disappear if the diagnosis had been correct.

If a pain which had been persistent disappeared after forceps were removed, would the interference be irresistible that the pain was caused by the forceps?—Your word "irresistible" is one with which we are not familiar in medicine, but if you will talk in terms of probabilities, then I should say that if the patient had complained consistently of a pain, and that a pair of forceps such as I have seen had been removed from the abdominal cavity, then even I should be optimistic enough to hope that the pain would disappear.

The witness was not re-examined.

MISS SARAH JANE KINGMAN.

Examined by Mr. RAYNER GODDARD.

Miss Kingman said that she was a State-registered nurse. Between 1920 and 1924 she had attended many operations at the Hydro. She remembered the operation upon Mrs. Crotch quite well; it was the first operation performed by Mr. Miles at which she had been present. She had worked with Nurse Brown, who was a very competent theatre sister. She had helped to wash the instruments after the operation, but it had been the duty of the theatre sister to count them. There had been ample time to count them, as the theatre sister had very little to do at such an operation. The instruments had been counted after this operation; this was a sacred duty. The sister knew how many there should be, because she had sterilised them before the operation and had then counted them with the surgeon. That also was a sacred duty.

Cross-examined by Mr. MORRIS.

Miss Kingman said that she had been employed at the home and had not come in specially for the operation. The average number of operations at the Hydro was not one a day.

DR. HENRY EDMUND GASKIN BOYLE.

Examined by Mr. DICKENS.

This witness stated that he had given anæsthetics for Mr. Miles for about twenty-five years at many operations. He testified that Mr. Miles was a very skilful and careful surgeon indeed. Mr. Miles always used large forceps inside the peritoneum and small ones at the beginning of the operation for picking up the vessels before the peritoneum was cut. The large forceps were called Kocher forceps. By the time the peritoneum had actually been severed the small forceps had been removed from the table. This was the invariable practice at Mr. Miles's operations. He had been struck many years ago by Mr. Miles's practice of putting out his instruments in multiples of three, a practice from which he had never known him to depart. He would hand them to the theatre sister in threes or multiples of three and she would put them into the steriliser. At the end of the operation he would ask the theatre sister if the count was correct; he had never known Mr. Miles fail to do this. Mr. Miles brought his instruments to the theatre in a regular bag, and would lay out only those which he required.

Cross-examined by Mr. MORRIS.

The witness stated that even if a patient's heart was reported to be failing, he did not allow panic. He admitted that the anæsthetist could not always follow every step of an operation.

This witness was not re-examined.

DR. JOHN SOUTHERDEN BURN.

Examined by Mr. DICKENS.

Dr. Burn stated that he had given the anæsthetic at the operation on Mrs. Crotch. Before and since this time he had given many anæsthetics for Mr. Miles. He corroborated the testimony of other witnesses concerning Mr. Miles's practice in counting his instruments with the theatre sister. The theatre sister, he said, would be able to say at any stage of the operation how many instruments were in the body. Mr. Miles would never sew up the wound without getting information from the sister that all the instruments had been accounted for, and according to the witness's recollection he had never departed from this practice. Mrs. Crotch had not borne the operation very well, but had collapsed somewhat towards the end. The witness remembered this particularly, having a particular reason to do so. He had seen English-made forceps, including Spencer-Wells, sold in Étaples at the end of the war; they were surplus Army stores and were going very cheap.

Cross-examined by Mr. MORRIS.

Dr. Burn said that the only structure removed at the operation had been a fibroid uterus; no other tumours had been removed.

If the patient was not taking the operation very well, what would be the effect upon the remaining course of the operation?—The operation would be completed as soon as and as safely as possible.

Would the termination of the operation be in any way expedited?—Yes; Mr. Miles might be able to put on a little extra speed which he would not use if there were no hurry.

This witness was not re-examined.

THE LORD CHIEF JUSTICE'S SUMMING-UP.

Counsel on either side having addressed the jury, THE LORD CHIEF JUSTICE said that this was a case of no little importance and difficulty. The case for the Plaintiff could not have been more elaborately and emphatically presented than it had been by learned counsel, but he warned the jury against being misled by the appeal to the emotions which had been quite legitimately made by her advocate. The task the jury had to perform was a scientific, not an emotional one. He continued:—

"Let me refer to one expression used yesterday by the Counsel for the Plaintiff. I do not know what impression was conveyed to your minds, but it seemed to me to be intended that should this action result in a decision adverse to this eminent surgeon it would involve no reflection on his general skill and standing. Can you accept that suggestion? It is quite idle to say that the reputation or the skill of the Defendant is not involved in this case. But the question is not whether it is desirable or permissible that a patient who undergoes an operation should afterwards be going about with a forceps in her body—nobody suggests that, and everyone must have the greatest sympathy with this lady—but the question here is, who did it? When something which excites strong feelings of passion or indignation has happened, if the mind is allowed to be filled with those feelings, do they help it in a strictly *scientific inquiry*?

"The learned Counsel for the Plaintiff began the last passage of his speech by a rhetorical enumeration of the points he conceived to be strongly against the Defendant. He said in effect, 'You are told that these instruments and swabs are not counted when an operation is done in France? What does that matter if you are satisfied that these were the forceps of the Defendant?' I choose that question as indicating to you the kind of fallacy into which it would be most unfortunate to slip. You are inquiring whether these are the forceps of the Defendant. How can you be satisfied that these are the Defendant's forceps when you now know by the mouth of the Plaintiff's own witnesses that forceps and swabs are not counted in France? Of course, if you are satisfied that these are the forceps of the Defendant, what was done in France does not matter. But it is vital to have regard to what was done in France in order to know whether you may properly inquire whether these are the Defendant's forceps. Let us put the matter the other way round. Suppose that the evidence about the operation conducted by Dr. Prat in France was that for years he had been conducting operations with the assistance of a careful method deliberately designed by himself to prevent an error about the number of instruments [illegible] swabs; suppose that Dr. Prat had been able to say, [illegible] *have designed a system of multiples of three.* [illegible] count myself, the theatre sister counts, I check the counting of the theatre sister.' Suppose that had been the evidence about Dr. Prat's operation, and suppose when it came to Mr. Miles's operation he had had to say, 'I never count at all, and nobody counts for me, it is not done,' how indescribably stronger the case against the Defendant would have been. Now, you see, the position is reversed. The evidence of care in counting and of method in counting is the evidence of the Defendant and the evidence given on his behalf, and it is conceded that in French operations there is no counting by the surgeon or by another. You may think it right to say that the measure of the additional strength that would have been given to the case against Mr. Miles if the position had been reversed is the measure of the *assistance which his case derives from the knowledge* which you now have that in the French operation there is no counting."

His Lordship then laid down the questions which the jury had to decide:—

(1) Is it established that the forceps were left in the Plaintiff's body in the course of the operation performed by the Defendant?

(2) If so, was that fact due to negligence on the part of the Defendant or for which he is responsible?

(3) The question of damages, if it arises.

He then discussed the question of damages. In addition to the medical fees and expenses incurred, he pointed out that the Plaintiff claimed £500 lost by her through having to leave Paris because of her ill-health. He asked the jury whether it was right to attribute that loss to the presence of these forceps. There was also a claim for £100 loss on profits in the Plaintiff's business, an antique shop at Vence, near Nice, which she had had to give up. This, however, related to the period antecedent to the following on the operation carried out by Dr. Prat for gall-stones. Two things were involved in this claim—namely, that the trouble in the gall-bladder was caused by the presence of the forceps, and that in consequence of the necessity of that operation this loss of £100 was incurred. The question with regard to these and other figures was whether the jury thought it clear that these losses had been incurred and were attributable to what had been done or omitted at the operation in 1920.

The Liability of the Surgeon.

Lord HEWART continued:—Nobody denies for a moment that if a surgical forceps is left in the body of the Plaintiff in the course of a surgical operation, that patient ought to have a remedy in damages against somebody. The whole question here is, *however: Is the liability of this Defendant made out?* If you are satisfied that it is, you will not hesitate by your verdict to give expression to that view. There are few things so extraordinarily difficult to trace with certainty and assurance as the relation of cause and effect. What you are invited to do here is to say that it is established beyond reasonable doubt that this surgical instrument was left in the Plaintiff's body in November, 1920, under circumstances which involved the operating surgeon in personal liability. What is the personal liability of the surgeon? It is not quite a simple question. As the case went on and the evidence accumulated, the question underwent a certain development, and it is necessary to distinguish between different things. Let me remind you of a passage in the evidence that was given on commission on behalf of the Plaintiff by Dr. Fay, the surgeon who carried out the final operation for the removal of the forceps in September, 1928. He stated that for operations of this kind the surgeon must be assisted by a team—an assistant, an anæsthetist, and one or two sisters, and each member of that team has his or her particular part in the operation. Dr. Fay was asked, "If the surgeon knows and trusts the members of the team, he will not interfere with their particular part in the operation?" The answer was "Yes." "He will *not* interfere with the giving of the anæsthetic?" "Quite so." Dr. Fay was further asked, "Is it not the practice of the surgeon to leave the counting of the instruments and swabs to a sister?" Dr. Fay answered, "It ought to be like that." A further question was, "Then it is possible for the surgeon or his assistant to leave instruments or swabs in the body without personal negligence?" and the answer was "Yes, it is possible."

Let me remind you of what was said by Mr. Miles as to the usual practice. He described to you in detail his method based on an enumeration of threes, and how when he arrived at the scene of the operation he handed over the instruments to the theatre sister. "I count them out to her and show her that they are in threes and multiples. She sterilises them and lays them out on the special table. This is done while I am making myself aseptic. In an abdominal operation like this the incision is made below the navel; it goes through the skin and the subcutaneous tissue and fatty tissue, and always there are three or four bleeding points. I use Spencer-Wells 5-inch pressure forceps to seize these vessels to enable me to tie them. I generally do the tying and my assistant removes the forceps. Sometimes it is the other way round."

Lord HEWART then read other portions of Mr. Miles's evidence, showing the method whereby the carefully trained theatre sister carried out the counting of the instruments and swabs. He continued: All the evidence on this question of the relative responsibilities and liabilities of the theatre sister and the surgeon has come from the Defendant's side. The Plaintiff's evidence is extremely interesting for what it says. You may think when you apply a critical eye to it that it is in some places not less significant for what it does not say. The evidence of the doctors in France taken on commission, and on this particular point the evidence of Dr. Fay, is that you look to the theatre sister. Not so with the evidence adduced on behalf of the Defendant. Sir Hugh Rigby stated that in attendance at the operation are the surgeons, the assistant, the theatre sister, generally two nurses, and the anæsthetist, that the theatre sister is responsible for the instruments, the sterilisation of the instruments, the towels, and the swabs, and that she is very highly trained for this work. Sir Hugh Rigby said, "In our country she is something quite apart. She is especially trained for this duty, and has responsibilities which sisters in other countries are not given because they are not trained. I do not think one person can be responsible for all the details of the operation. The duty of counting instruments or swabs falls, according to the usual practice in this country, upon the theatre sister." Then came this passage, of no little importance in this case. "My own practice is to do nothing"—this is Sir Hugh Rigby speaking, the King's surgeon—"and if the sister finds that she has not the right number she tells me. If I hear nothing I take it that all is correct. It is very seldom that I myself inquire. If I were working in a strange place, or did not feel confidence in the sister, I might do so." Sir Hugh Rigby also said that it was in the interests of the patient that the duty of counting should be left to the sister. He said that unless he was warned by the sister he was not expected to make a search. It would be against the interests of the patient for the surgeon to have extra manipulations to perform. He went on to say that the standard of care in this matter of enumeration which was set and observed by the Defendant was a standard higher than the ordinary and a standard to which the ordinary surgeon could not be expected to attain.

Then came Sir Thomas Horder. Sir Thomas Horder is a physician, and he expressed the physician's point of view. He regarded the ultimate responsibility as depending upon the surgeon. He said, "I agree that the surgeon's responsibility is at the close to check the counting. I regard the surgeon as ultimately responsible in all these matters." What emerges from that evidence, and from other evidence like unto it? You may think it is right to draw a distinction between what is done in the course of the operation and what is done immediately at its close. It may well be that in the actual course of the operation, while the surgeon is cutting and opening and attending to his surgical task, it is not to be expected nor desired that he should be busying his mind with the counting of instruments or swabs or with the question of whether a swab or instrument is missing. But you may think that other considerations apply at the close of the surgery itself. It may well be that any delay might be highly prejudicial if it occurred before the body of the patient was stitched up, but after that you may think that before the surgeon departs it is reasonable that he should personally satisfy himself that the number is correct, and that there is nothing missing. Mr. Miles says that he does that. Sir Hugh Rigby said that it is not usual, and he himself does not do it. These questions are very material as regards the second question I have put to you, but that question, of course, does not arise at all unless you are satisfied that the forceps were left in the body of the patient at the operation of 1920. If you are satisfied as to that, the question then arises as to whether this was due to negligence on the part of the Defendant or negligence for which he was responsible. This is not quite a simple question. What is it that the surgeon undertakes? I quote the words of Lord Chief Justice Tyndall a hundred years ago, but unimpaired in their effect:—

> "A person entering a learned profession undertakes to bring to the exercise of it a reasonable degree of care and skill. He undertakes to bring a fair, reasonable, and competent degree of skill, and you will say therefore in this case that the injury was occasioned by the want of such skill in the defendant."

Skill must be also accompanied by diligence, and you have to decide (if this question arises) what exactly are the position and the responsibilities of the surgeon in the matter. Of course, you and I are looking back upon this matter after the event has happened. There are few things so unhelpful as the wisdom that follows the event. You have to put yourselves for this purpose at November, 1920. Was it in November, 1920, part of the duty of the surgeon personally to count the instruments and satisfy himself that the number was correct, or was he entitled to say that there was present a skilled theatre sister, that this was her job, and that he was entitled to act upon her report? She is not his servant, she is one of the team. We can all make mistakes. I suppose it is quite conceivable that somebody in an individual case might miscount a certain instrument. You have to address your minds to this question: suppose the theatre sister did miscount and thought there were six of these instruments when there were only five, is the Defendant responsible for that happening? Is it a breach of duty on his part that the theatre sister made that mistake? You may think it is linked up with the question as to what he did afterwards. If the evidence given on behalf of the Defendant in this case is accepted, it is exceedingly difficult to entertain the view that this forceps got into the Plaintiff's body in November, 1920.

Apropos of that observation, let me remind you of this, that when in these Courts a Plaintiff is seeking to recover damages for something wrongful which is said to have been done actively or by omission, then the burden of proof is on the Plaintiff to show that that complaint is made out, and is made out against the very Defendant. The proof is not the other way round. It is not for the Defendant to prove a negative. Indeed, as this case has gone on, you may have reflected how wise our ancestors were in devising Statutes of Limitations, preventing some kinds of action being brought after four years, and most kinds of action from being brought after six years. Why? Because it is so uncommonly difficult to recollect with accuracy what precisely was done so many years ago. It would be intolerable if, when an allegation was made about something done nine or ten years ago, the burden of proof were upon the Defendant. In the extremely difficult question of tracing cause and effect we must never lose sight of the fact that the burden of proof is upon the Plaintiff. If you are satisfied that that burden has been discharged, the conclusion is clear, but if you are not satisfied, if you are left in real doubt, equally the conclusion is clear, that the case is not established."

Lord HEWART then remarked that this type of accident, revolting to the mind as it was, was a sort of accident that happened very rarely. In more than thirty years' experience of courts of law he himself had never known anything like it. It was something very rare, but if there was no counting by the surgeon or by anybody on behalf of the surgeon, was it difficult to understand that such a thing might conceivably happen? Might not the absence of counting explain how it came to happen? The thing which was being dealt with here was a thing called a forceps, superficially like a pair of scissors, but having a very different function. The function of the forceps was to hold firmly. When the bleeding points were exhibited in the course of the operation the forceps were used to take up each point, pinch it, and stay the bleeding. The forceps having played its part, there followed the use of the ligature, and when the ligature was put on the forceps might be removed. The effect of this was that the forceps might be there for an appreciable time; there might be a row of forceps, and when the forceps were removed, if there was no counting, and especially if the patient was rather stout, the loss of a pair of forceps was a thing which might possibly happen. The fundamental contrast between the practice in counting on this side of the Channel and on the other was the first thing that leapt to the eye. The next thing was the remarkable contrast in the Plaintiff's evidence as between the amount of medical evidence relating to 1926 and the paucity of such evidence during the period from 1920 to 1926. Mr. Miles, in his evidence, had said that when the patient came to him in May, 1921, to the best of his recollection there had been no hernia, because if there had been he would have reported it to the patient's doctor, Dr. Wadd, and would have suggested a belt. Dr. Wadd had testified that he had seen the patient in January and February, 1921, that she had had insomnia and nervous exhaustion, as well as domestic worry, but that she had never led him to think that she had anything wrong with the abdomen. There had been no swelling, no hernia, no bulging; she had never directed his attention to any lump. The Plaintiff had afterwards gone to Margate and stayed there till the end of September. She gave a poor account of her condition, but no doctor who had seen her at Margate had been called to give evidence. In India and in Paris there was again no medical evidence. If that forceps had been in the lower part of her abdomen during those five and a half years, how came it that there was this gap in the medical testimony? There was, of course, the evidence of Dr. Stevens, whom the Plaintiff consulted in 1921, 1922, and 1923. Altogether, spread over those years, there were 21 occasions on which Dr. Stevens had his attention directed to the Plaintiff. He had said that the Plaintiff was complaining of pain low down in the abdomen, swelling in the middle line of the abdomen, attacks of nausea and vomiting. He knew of her operation, and said that she had had a ventral hernia. Ventral hernia was a very common sequel to an abdominal operation in a fat subject. Dr. Stevens had never suggested that it was a case for an X ray examination to see if there was some foreign body left in the abdomen. Was it to be supposed that if, by manipulation or otherwise, Dr. Stevens had detected the presence of a foreign body, he would not have called for an X ray examination? His conclusion had been that that which he saw was consistent with the ordinary consequence of an abdominal operation. How came it also that nobody who had examined the Plaintiff in Bombay had suggested an X ray photograph? The Plaintiff had said that the lump had always been there, about the size of a small cocoanut. The doctors in the hospital at Bombay had examined her and, presumably, noticed a lump. Was it to be supposed that these medical men, if they had suspected the presence of a foreign body, would not at once have taken steps to see whether there was not some foreign body there? The Plaintiff had said that the pain had continued daily for eight years until the removal of the forceps. The question was whether that was not an exaggerated statement. She had also said she had felt as if she had been eating rusty nails. That expression threw a good deal of light on this story. Who knew what it felt like to have eaten rusty nails? Was it not the very sort of picture which might occur to a somewhat imaginative person looking back after a period of time when she knew that a pair of forceps had actually been discovered in her abdomen?

Lord HEWART then asked whether it was credible that if during all this time she had been suffering in the way she had described, and had had a lump of this kind, she would not have seen the surgeon who had performed the operation. She had explained the fact that she was silent about it by saying that he had assured her on her visit in May, 1921, that there was nothing vital the matter and that she must regard this sort of thing as a necessary consequence of the operation. Finally, had come the operation of June, 1926, by Dr. Prat, and the Defendant had suggested that this forceps had been left in the Plaintiff's body by some inadvertence on that occasion. The proof that this was so did not fall upon the Defendant, but what he said was that, when all the surrounding circumstances were considered together with the actual course of the operation of 1926, it could not be said that these forceps had entered the patient's body during the operation which he had performed in 1920.

JUDGMENT.

The jury, after a short absence, found that it had not been established that the forceps had been left in the Plaintiff's body in the course of the operation performed by the Defendant.

The LORD CHIEF JUSTICE thereupon entered judgment for the Defendant, with costs.

Special Articles.

MEDICAL INVENTIONS AND PATENTS.

VIEWS OF THE BRITISH SCIENCE GUILD AND THE JOINT CHEMICAL COMMITTEE.

A REPORT on reform of the British patent system, recently issued by the British Science Guild (6, John-street, Adelphi, London, W.C. 2. 2*s.*), dealt incidentally with the patenting of biological inventions. The Committee was appointed by the Guild in April, 1927, to consider what changes could advantageously be made in British patent law, and only reported after holding 18 full meetings and preparing and circulating many memoranda. Its chairman was Mr. W. H. Eccles, F.R.S., President of the Physical Society, and its hon. secretary Capt. C. W. Hume, B.Sc., joint hon. secretary of the Guild. In an introductory note the fundamental object of the patent system is described as an encouragement to the establishment of new industries and the improvement of old ones by the granting of temporary monopolies, owing to the protection afforded by which manufacturers and financiers are induced to risk their energy and capital. In the absence of a patent system the practice of secret working grows apace, and this may well cost the manufacturer more than the open working of a patent system, and have the further objection of postponing or even preventing publication. Holland, which abolished its patent system in 1869, reinstated it in 1912 owing to the decline in its manufactured exports. The patent system, it is held, is useful to the community in a variety of indirect ways; inventors are encouraged to embody their ideas in specifications which promote the free circulation of new ideas, while the collected specifications record the growth of applied science hardly possible in any other way.

Research and Invention.

Modern research has, however, altered the volume of invention, notably in the chemical and biological sciences, and has made it harder than it was before to define an invention, for invention may be a flash of intuition or it may be the result of a system of research by a scientific staff. It is difficult to draw a clear distinction between such a process of research and the use by a skilled workman of the known rules of his art—and in law no patent is valid unless the invention contains "subject matter." In practice the Guild sees no reason why patents should not be granted to protect improved biological products, and considers it desirable to extend the interpretation of the word "manufacture" so as to permit of the patenting of a wider range of biological inventions. In view of the strong contrary opinion of the medical profession the Guild considers that biological inventions subserving medical treatment should not be patentable.

Taking this report as the basis of consideration, the Joint Committee, including eight of the principal chemical associations of the country, has formulated its own proposals, which have now been issued in a memorandum (from the Joint Chemical Committee, 116, Piccadilly, London, W.1. 1*s.*). Mr. A. Rée, Ph.D., and Mr. F. H. Carr, D.Sc., have acted as chairmen of this Committee, which had Mr. J. Davidson Pratt, F.I.C., for its secretary. The Joint Chemical Committee acknowledges the services rendered by the Guild in indicating clearly the need for changes in our present system and in submitting constructive proposals to this end. Medical inventions are dealt with in a short section of the memorandum, and in great detail in an appendix thereto.

The subject of patents for inventions subserving medical treatment has received long and detailed consideration from the Joint Chemical Committee. While it is at present permissible, the memorandum states, for patents to be obtained for medical inventions, the position is very unsatisfactory, and British industry and research are being handicapped in that the results of British investigations are being exploited by foreigners who have not the same feelings in regard to medical patents as the British medical worker. Some solution of the difficulty should be found which will meet the objections of the medical research worker to patents on ethical grounds and the desire for sufficient protection on the part of the manufacturer, whose coöperation is essential if the public is to obtain full value from new medical discoveries. There is a choice between:

1. No medical patents at all, being the view advocated by the British Science Guild in regard to biological inventions in the medical field;
2. A system of medical patents devised to meet the two points of view already indicated.

While a non-patent system may find favour in medical circles, it does not afford the necessary protection to manufacturers, and may in practice lead to the extended use of secret manufacture and secret remedies, with results which are objectionable both on general grounds and in regard to the restrictive effect on further research. In any case, the abandonment of medical patents by this country, without international agreement on the subject, would place both our research workers and our manufacturers at a serious disadvantage.

The Present Position.

Section 38A (1) of the Patents and Designs Acts 1907 and 1919 (Consolidated), is as follows:—

> "In the case of inventions relating to substances prepared or produced by chemical processes or intended for food or medicine, the specification shall not include claims for the substance itself, except when prepared or produced by the special methods or processes of manufacture described and claimed or by their obvious chemical equivalents; provided that, in an action for infringement of a patent where the invention relates to the production of a new substance, any substance of the same chemical composition and constitution shall, in the absence of proof to the contrary, be deemed to have been produced by the patented process."

Under this Section, therefore, it is possible to take out patents for medical remedies, which may be divided roughly into two main classes:

(*a*) Definite chemical compounds, with a specific effect in certain diseases. Such inventions usually arise from purely chemical investigations, and the medical research worker only intervenes at the stage of pharmacological and clinical trials;

(*b*) Biological productions such as vitamins, insulin, serums, vaccines, &c. These products generally originate with the medical research worker, but the chemist (or biochemist) comes in, during the later stages when isolation and investigation of the active principles (e.g., adrenalin, thyroxine) of such products is attempted.

These two classes may overlap, but it is clear that there are two groups of workers concerned—chemists and medical research workers.

Medical Objection to Patents.

Chemists as a body appear to have no objection to taking out patents for substances used for medical treatment, since eminent chemists, including university professors, are to be found among British patentees of such products. It is, however, quite otherwise with the medical profession, a large section of which is believed to be resolutely opposed at present to taking out such patents, whether they be of purely chemical or biological origin, and the following are the two main arguments advanced.

In the first place, the medical profession is peculiar in its special relation to human life and suffering, and when doctors prescribe a particular drug they are expected to be free from any suspicion of financial bias in its choice. A patent in relation to any medical remedy tends at first sight to give the impression of making profit out of human suffering.

The second and more important objection, the validity of which is, however, doubtful, is that the freer use of patents would result in greater secrecy on the part of research workers, whereas the fullest and freest interchange of knowledge and mutual assistance between workers in different laboratories is essential for progress.

Secrecy would undoubtedly have a very adverse effect on medical research because of the complexity of the problems, and the necessity for the full and rapid publication of all information bearing on them. There is, however, some doubt as to how full and early publication can best be assured.

Knowledge and Reward.

The object of our patent law is to stimulate invention by offering a reward, and to extend industry in this country by the application of new discoveries. In other fields it succeeds in that object, even though in them, as in medicine, it often happens that the patented invention does not benefit the actual discoverer of the knowledge on which the invention depends. While this is a state of affairs very difficult to avoid or to remedy, it is important to seek for compensating influences thereto. The border line between discovery and invention is very difficult to define in medical fields. A medical discovery is often the culmination of years of progressive research by many workers, and it is manifestly unfair that the worker who is lucky enough to take up the work at a certain stage when most of the work has been done, and who merely puts the finishing touches to it, should be able to reap the sole monetary reward of the cumulative effort. Such a state of affairs usually discourages scientific workers who have contributed largely to the research on which the invention is based, when they find that the knowledge they have freely provided is being monopolised by the inventor of perhaps merely a small addition or modification. The fact remains, however, that the general motive of most scientific workers is the satisfaction of advancing knowledge and not monetary reward.

Three Instances.

The memorandum proceeds to glance at the circumstances surrounding one or two important instances in which the question of patents has been involved in connexion with inventions subserving medical treatment.

1. *Insulin.*—In 1923 Dr. Banting made the final addition to a long series of discoveries by which the preparation of insulin was rendered possible. This was protected by a patent taken out in the name of the University of Toronto, where Dr. Banting was working. The British patent rights were offered by the University to the Medical Research Council, whose action in accepting them caused much unfavourable comment in the medical profession and some opposition by important men of science. It is understood that the Council did so on the grounds:

(*a*) That the patent was better in their hands than in anybody else's;

(*b*) that it enabled them to exercise the power which was necessary in order to secure the proper use of the knowledge and to control the manufacture of insulin, there being at that time no Therapeutic Substances Act by which this could be effected.

It is agreed that events have fully justified this action, as it has resulted in insulin of the highest quality being now available at very low cost, owing to the fact that the few firms to whom the manufacture was entrusted were enabled thereby to devote considerable energy and capital to developing efficiency in manufacture and a high quality of product.

2. *Thyroxine.*—At the time that Dr. Harington published all but the final stage of the synthesis of thyroxine, he decided not to patent this method, and thus he left unguarded the possibility of other workers, perhaps abroad, obtaining a monopoly of synthetic thyroxine by discovering the last step. As it happened, Dr. Harington was later successful in completing the synthesis, which was never patented. Though there is now no master patent, there remains the danger, however, that some foreign manufacturer may become possessed of some patent which, though

It will be noted that the general tendency of the recommendations of the committee is toward (1) a more complete centralisation (as regards professional appointments), and (2) a better coördinated service. If they are made effective the further step of transforming the public medical service into a State Medical Service will be short and easy.

Actions for Damages for Alleged Illegal Detention.

An application was heard by Mr. Justice O'Byrne, in the High Court, Dublin, recently, to stay, on the ground that it was frivolous and vexatious, an action brought by Mr. Patrick Moore against Dr. J. O'C. Donelan, resident medical superintendent of the Grangegorman Mental Hospital, for damages for alleged illegal detention. Having heard counsel for Dr. Donelan, and the plaintiff who appeared in person, the judge made the order asked for.

He said that it appeared that the plaintiff was detained in Grangegorman Mental Hospital from May 6th to June 28th, 1927, and his action was concerned with that detention. It also appeared that he was apprehended by the Civic Guards and brought before Mr. Kenny, who was acting as District Justice in the Dublin Metropolitan Court. Mr. Kenny, acting in that capacity, made an order that the plaintiff be forthwith detained in the district lunatic asylum That committal warrant was admittedly made by Mr. Kenny in that capacity, and it had never been set aside. Mr. Moore was taken to the institution in pursuance of that warrant and detained. His lordship also referred to the order of the Chief Justice removing the plaintiff to e care of Dr. Eustace, and said that in the circumstances seemed to him that there was no illegal imprisonment y Dr. Donelan. Not only was the detention of Mr. Moore not illegal, so far as Dr. Donelan was concerned, but Dr. Donelan was absolutely bound in pursuance of the warrant to take Mr. Moore into the institution and detain him until he was legally removed. It seemed to him that the action was frivolous and vexatious, and an abuse of the process of the Court, and could never succeed.

An action for damages on similar grounds taken by the same plaintiff against Dr. W. N. Eustace, of Hampstead Private Asylum, Dublin, was subsequently stayed on an application to Mr. Justice Sullivan. The plaintiff had been removed from Grangegorman Mental Hospital and put under Dr. Eustace's care by order of the Chief Justice, and had been detained there from June 28th, 1927, to Jan. 25th, 1929, when by a further order of the Chief Justice he was removed to Carlow Mental Hospital.

The same plaintiff also took an action for damages against Dr. M. S. Walsh, dispensary medical officer, for alleged negligence in the issuing of a false medical certificate on May 16th, 1927, thereby causing the plaintiff to be imprisoned in Grangegorman Mental Hospital. Dr. Walsh had been ordered by the District Justice to examine and give evidence as to the mental condition of the plaintiff. An application for a stay in this case was adjourned by Mr. Justice Sullivan for the filing of a further affidavit.

The Sweepstakes Bill.

The Public Charities Hospitals (Temporary Provisions) Bill, commonly known as "The Sweepstakes Bill," which was introduced to the Dail by Sir James Craig, and passed its second reading a week or two ago, has now been returned to the House after consideration by a Special Committee. It has been amended in several respects. One amendment provides that only hospitals which reserve at least 25 per cent. of their beds for non-paying patients, and which exercise no discrimination in the filling of the beds on the ground of the religion of the applicants, are to be permitted to enjoy the privileges granted by the measure. A non-paying patient is one defined as paying less than 10*s.* a week. By another amendment institutions are excluded from the benefits of the Bill if there be in their charter, constitution, or regulations any provision debarring any person from appointment to the staff solely because of his or her religious belief. Another amendment provides that the amount to be deducted as expenses for the conducting of a sweepstake shall not exceed 30 per cent. of the money resulting from the sale of tickets. It is doubtful whether the measure will become law or not. Public opposition to it has been increasing, and most of the religious bodies have denounced it as encouraging gambling. Certain hospitals, too, which a little time ago were willing enough to benefit by sweepstakes, are now publicly expressing their disapproval.

The Irish Radium Institute.

The President of the Royal Dublin Society (Prof. John Joly, F.R.S.), announced last week that it was proposed to appeal for further support for the Irish Radium Institute. This institute, which is conducted in association with the society, has often found itself unable to meet the demand for radium emanation required for therapeutic purposes. The society hopes to raise a sum of £12,000, of which £2000 has already been guaranteed. Dr. Joly rightly takes pride in the fact that the method of using radium emanation in needles implanted in the tissues, now commonly employed, was first introduced in Dublin.

The Queen's Institute of District Nursing.

The annual general meeting of the Queen's Institute of District Nursing in Ireland, usually known as the Jubilee Nurses, was held last week, and a satisfactory report was presented. A year or two ago a movement was on foot to disrupt the institute between the Irish Free State and Northern Ireland, but the attempt failed, and while each division of the country now enjoys a certain degree of local autonomy, the central control for the whole of Ireland rests with a Joint Council.

Vacancy on the Irish Medical Registration Council.

The regretted death of Mr. Maurice Hayes has caused a vacancy on the direct representation of the medical profession on the Medical Registration Council of the Irish Free State. Up to the present the only candidate who has announced his intention of coming forward is Mr. William Doolin, F.R.C.S.I. Mr. Doolin is a graduate of the National University of Ireland, and one of the Surgeons to St. Vincent's Hospital. He has been honorary secretary of the Dublin Local Medical Committee for several years, and is the editor of the *Irish Journal of Medical Science.*

ROYAL WATERLOO HOSPITAL.—The report for last year records an improvement in the finances, due principally to legacies, which were especially welcome since the accumulated deficit was becoming a serious embarrassment. There were 2098 in-patients who cost £8 1*s.* 1*d.* each for an average stay of 18 days, and 16,000 new out-patients; each out-patient cost 7*s.* 7*d.* A further extension of the out-patient department is necessary, but the difficulty of obtaining a site has been increased by the rise in the price of land in the neighbourhood consequent upon the proposed removal of Charing Cross Station to the south side of the river.

WOMEN DOCTORS AND MARRIAGE.—At the annual meeting of the governors of Birmingham General Hospital last week the following resolution was passed by 22 votes to 16: "That it be made a law of the hospital that, apart from exceptional cases to be determined by the Board, married women shall not be eligible for appointments upon the medical staff, and that women members of the staff who marry during their tenure of office be required to relinquish their position, in view of the disorganisation of the work of the hospital which may be entailed owing to the demands of their domestic duties." The resolution was proposed by a woman member of the Board, who explained that the Board had thrice considered the matter and each time had passed the resolution by a considerable majority. The subject came to a head in consequence of the marriage last year to one of the assistant surgeons of a woman medical officer who, in applying for reappointment to her office, asked for four months' leave of absence as she was expecting to have a baby. The resolution cannot become effective for 12 months, since it must be confirmed at next year's annual meeting.

Correspondence.

"Audi alteram partem."

DISTRICT HOSPITALS AND THE GENERAL PRACTITIONER.

To the Editor of THE LANCET.

SIR,—The assumption by the county councils of the management of the district hospitals is likely to lead to changes in the methods and allocation of medical practice, which seem to be in the direction of increasing specialisation, thereby limiting the usefulness of the general practitioner. A questionaire as to the departments in which general practitioners are prepared to coöperate with the activities of the county councils, brings home to every practitioner the possibility that his work with private patients will be curtailed, without any likelihood of his getting, in large centres, much, or any, of the specialist work. Might it be suggested that this is not the most promising way of making use of the general practitioner? He has, while in practice, been acquiring, not special experience in specialist treatment, but special experience in diagnosis. His patients come to him for the relief of disease or disabilities, and it has been his business to find out whether they suffer from complaints which are trivial or temporary, or such that their treatment may be considered a matter of common knowledge, or whether they represent the beginning of more serious ill-health. If the latter, he has endeavoured with some success to learn whether such illness should be treated in hospital or at home, or by some particular specialist. He sends his patients where they are likely to get the advice and treatment which is most likely to benefit them. He does not flood the out-patient department of hospitals or the consulting rooms of specialists with phlyctenular ulcers, or cases of herpes or hydrocele but thinks himself at least equal to the receiving room offices of a hospital in deciding in what department, and from what specialist advice will be best sought. If, therefore he is asked to coöperate, use should be made of his special, rather than of his specialist experience, and he should be asked to undertake the charge of beds in the district hospital. The medical officers to the hospital should be like the surgical medical registrars in earlier days, exercising a general supervision and giving generous help to the house surgeons and house physicians who were in charge of the surgical and medical beds.

With a specialist team behind them, the general practitioners of a neighbourhood, each with a certain number of beds, would do excellent work, and be able to keep in touch with the patients they send to hospital on the one hand, and the work of specialist departments on the other.

Difficulties would undoubtedly arise as they do in teaching hospitals where certain members of the staff do better work than others, but, as in teaching hospitals, they would not be insuperable, and it would be far better for the public that the mistakes which the practitioner commits through want of care or want of knowledge should be committed in the publicity of a hospital ward, rather than in the dim light of a private bedroom.

The present system of having several hundred patients under the charge of a medical officer and two or more subordinates where the usefulness of the medical knowledge existing outside the institution is confined to a rather bitter criticism of facts distorted by the narration of ignorant patients or their friends, should be ended, and the experience of cottage hospitals, where many medical men have charge of patients, may be cited to show how much may be done in this direction to the ultimate advantage of the health of the community.

I am, Sir, yours faithfully,
ROGER N. GOODMAN.

Kingston-on-Thames, March 24th, 1930.

ÆTIOLOGY OF ENCEPHALOMYELITIS FOLLOWING SMALL-POX.

To the Editor of THE LANCET.

SIR,—The real difference of opinion between Prof. McIntosh and Dr. Scarff on the one hand and most other observers including myself on the other depends largely on the interpretation of the histological pictures in the encephalitis produced in animals by the virus of vaccinia and the disseminated encephalomyelitis following vaccination, small-pox, measles, antirabic treatment, &c. in man. Prof. McIntosh bases his view that post-vaccinal and post-smallpox encephalitis are directly due to the virus of the exanthem on the alleged similarity of the cellular reaction in the two types of encephalitis mentioned above, and his contention that the perivascular demyelination of the latter "is rather a sign of severe intoxication and is not specific" is placed on record in his last article on the subject (THE LANCET, March 22nd, p. 621). In a paper forthcoming shortly in the *Journal of Pathology and Bacteriology*, Dr. Fairbrother and I show that the cellular reaction in experimental vaccinial encephalitis is totally different from that in post-vaccinal encephalitis; moreover, in common with the majority of neuropathologists, I believe that the perivascular demyelination of the latter disease is the primary and essential feature and that the cellular response (microglial) is conditioned by the destruction of these fatty sheaths. No worker with the virus of vaccinia has up to the present time succeeded in reproducing experimentally this demyelination, and much other evidence (particularly the peculiar grouping and not infrequent familial occurrence of cases) is available to show that, while the virus undoubtedly plays some part in the ætiology of post-vaccinal encephalitis, it is not directly responsible for the condition. I maintain therefore that at the moment we are justified in seeking some additional factor, which may or may not be a virus, to account for these cases. To me the problem seems comparable with that of disseminated sclerosis following an acute infection to the direct action of which it can hardly be attributed; examples of a disseminated encephalomyelitis similar to that occurring in the course of vaccination, measles, and so forth but arising independently are known.

I am, Sir, yours faithfully,
March 25th, 1930. E. WESTON HURST.

COMPULSORY TREATMENT OF VENEREAL DISEASE.

To the Editor of THE LANCET.

SIR,—I am afraid that Miss E. O. Grant, secretary of the British Social Hygiene Council, has missed the point of my communication published in your issue of Jan. 18th (p. 159). In her letter in the following issue (p. 213) she quotes the resolutions of her executive committee, which show that the Council takes a non-committal attitude with regard to the compulsory treatment of venereal disease. They are, of course, perfectly right in taking this attitude, but I desire, with great respect, to point out that this has no bearing on my contention that the medical advisers of the Scottish corporations were not justified, in the light of recent observations, in again urging these bodies to obtain statutory powers to enforce a certain course of treatment even on defaulters, particularly in syphilis. The investigations quoted in my letter showed that there was good reason to believe that such measures were not devoid of risk, and that there was evidence that the multiple fractional doses used in modern antisyphilitic therapy have been followed by an increased incidence of vascular and visceral manifestations.

My contention is—and I feel sure it will be generally supported—that it is imperative to institute an independent inquiry to decide whether these observations are correctly interpreted. I suggested that these investigations should be on the lines so ably that the officials charged with maternity questions, Sir George Newman and the chief officials of the Ministry, should run about the country all day long; that was not the business of chief officers.

Lieut.-Colonel **Ruggles-Brise** said that Parliament would be making a great mistake if they tried to set up a machine closely following on all the other lines of bureaucratic machinery to which they were accustomed, and which might be quite good in many other ways. A special measure of elasticity was necessary in this connexion, because the machine of the Board of Control had the power of dealing with matters affecting the liberty of the subject, a power to which there was no analogy in any other machine or department of State.

After further debate,

Amateur Bureaucracy.

Mr. **Greenwood** said that the proposal in the Bill was to make the machine of the Board of Control effective. The proposal of the amendments was to extend bureaucracy.

Lieut.-Colonel **Fremantle**: Anti-bureaucracy.

Mr. **Greenwood** said he would have thought that the worst kind of bureaucracy was amateur bureaucracy. After going into this matter with great care the Royal Commission felt that what was wanted was a small expert body of people with medical and legal knowledge and administrative experience. That was being provided for in the Bill. The addition of more lay members of the Board would not get rid of the Minister of Health's official responsibility for being the spokesman of the lay mind and of public opinion in these matters. He found it difficult to understand any real justification for either increasing the size of the Board or for adding unpaid members to it. He hoped, therefore, that the Committee would agree to Clause 11 and to the amendments which he (Mr. Greenwood) had put down designed to secure more effective working, and which had been put down after discussion with the Treasury.

After further debate,

Lieut.-Colonel **Fremantle** said that unless the Minister was prepared to reconsider this matter it would be raised again both in and out of Parliament during the remaining stages of the Bill.

Mr. **Greenwood** said that he was sorry that Colonel Fremantle had sounded so fierce when he expressed the desire to fight this matter through. There was very little on which to fight in view of the specific recommendation of the Royal Commission.

The Committee having rejected Colonel Fremantle's amendment to increase the number of the Board from four to six by 19 votes to 8, Miss Lawrence's original amendment was agreed to.

"Senior Commissioners."

Miss **Lawrence** moved an amendment to the effect that the members of the Board of Control should be styled "senior commissioners." She explained that this was the first of a set of amendments, the object of which was to meet the proposal that the senior commissioners, who were themselves appointed by the Crown, should appoint assistant commissioners to carry out the work of visitation. That work would be directly under the senior commissioners.

Lieut.-Colonel **Fremantle** said that he and his colleagues were not opposed to this proposal, though they were to some of its implications. He would reserve comment on that, however, until a later stage.

The amendment was agreed to.

Lieut.-Colonel **Fremantle** moved an amendment to provide that there should be at least two medical commissioners, and that one should be a woman registered medical practitioner. He said that if the Board of Control were going to be mainly glued to their office seats in Whitehall it would obviously be necessary that they should be possessed of the kind of experience necessary for them to fulfil their functions. There were two entirely different lines of work in the medical profession; one was institutional and the other scientific. The two did not work freely together in the higher offices. A man was devoted to scientific work or administration. Very few men in this country could combine the two. The Royal Commission had abundant evidence which they felt justified in bringing into their conclusions that it might be desirable to have two medical commissioners. It was quite open, without any expansion of the Board, to say that two out of the five commissioners should be medical. He excluded the chairman and the legal commissioner; but of the remaining three his amendment proposed that two should be medical and one a woman practitioner. This was put forward strongly by the Medical Women's Federation and various bodies speaking for women doctors, and by some of the mental welfare societies as well. He did not think it was put forward by the medical superintendents and the societies representing them, as they were a male body, but the proposal was supported by women generally, and especially by medical women.

Miss **Lawrence** said that they did not want to make the Board too big. The Government were proposing one more member than the Royal Commission recommended, and they thought that on balance, having regard to efficiency and expense, that that was enough, and they left the fourth commissioner unearmarked. That commissioner might be any person of merit suitable for the position.

The amendment was negatived.

The Committee adjourned.

The Mental Treatment Bill was further considered by Standing Committee A of the House of Commons on Tuesday, March 25th. Mr. **Cecil Wilson** was in the chair.

Reorganisation of the Board of Control.

On Clause 11 Lieut.-Colonel **Fremantle** moved an amendment to provide that all the commissioners of the Board of Control should be appointed by the Crown on the recommendation of the Lord Chancellor or the Minister of Health in the manner proposed in regard to the five senior commissioners. He said that it was proposed that the junior commissioners should be appointed by the senior commissioners. This would mean that when these officials visited the various mental institutions of the country they would carry less weight than if they had been appointed by the Crown. This would be a disadvantage, because it was desirable that the commissioners who visited these institutions should possess the greatest amount of authority possible.

Miss **Lawrence** (Parliamentary Secretary to the Ministry of Health) said that this amendment struck at the whole plan of reorganisation of the Board of Control proposed in the Bill. The idea was to secure a small body of senior administrative officers who would be appointed by the Crown, and that there should be a number of junior commissioners, but nevertheless important officials, who would work under the Board exactly as was the case in any well-conducted Civil Service department. The present Board of Control had been found to be an unwieldy body. She could not accept the amendment.

Dr. **Vernon Davies** said that it was not desired to interfere with the departmental control of the Minister. The whole point was the status of these junior commissioners in the eyes of the heads of the mental institutions which they would have to inspect. Some of those superintendents were most eminent alienists and psychologists of world-wide repute, and they ought to be visited by officials of somewhat similar status.

Dr. **Morris-Jones** said that he did not think there were any insuperable difficulties in the way of accepting this amendment. Mental disease was not in the same category as other branches of medicine, and these junior commissioners would be called upon to meet men in the very front rank of the medical profession in respect of their knowledge and experience of mental disease. There could be no doubt that they would suffer in prestige if it was known that they were appointed by the senior commissioners, and not by the Crown. He thought that the amendment would strengthen the Bill.

Dr. **Vernon Davies** appealed again to the Minister to accept the amendment.

Mr. **Greenwood** said that the logic of this amendment was that everyone who did the work of visiting institutions should be appointed direct by the Crown. He thought that no case had been made out.

The amendment was negatived by 17 votes to 7.

Legal Senior Commissioners.

Miss **Lawrence** moved an amendment providing that no person should be appointed a legal senior commissioner unless either: (1) he was a practising barrister or solicitor of at least five years' standing; or (2) he was a commissioner, other than a senior commissioner, and was, at the date when he was appointed such a commissioner, a practising barrister or solicitor of at least five years' standing; and no person should be appointed a medical senior commissioner unless he was a registered medical practitioner of at least five years' standing.

Dr. **Morris-Jones** moved an amendment to the amendment providing that no medical senior commissioner should be appointed unless he was a registered practitioner of at least seven years' standing. He said that it was quite wrong that it should be possible for a young man of 26, with only five years' experience, should be qualified for appointment as a senior medical commissioner of the Board of Control.

Miss **Lawrence**, in resisting the amendment, said that she regarded it as a frivolous one.

Dr. **Morris-Jones** protested against the remark of M[illegible] Lawrence. He was very anxious to see the Bill become law.

The amendment was negatived.

Dr. **Vernon Davies** moved an amendment to the amendment that no medical commissioner should be appointed who had less than five years' experience of psychological medicine.

Miss LAWRENCE said that she was afraid that this amendment would narrow the field of choice too much. There were very distinguished superintendents of hospitals of vast experience who had not had this amount of practice in psychology. It might therefore exclude people of great professional standing. She would refer the point to the Minister, but she could not accept the amendment at that stage.

Dr. MORRIS-JONES said he hoped that the amendment would not be accepted. It was too drastic.

The amendment was withdrawn.

Miss LAWRENCE's original amendment was then agreed to.

Unpaid Commissioners.

Miss LAWRENCE moved an amendment providing that after the commencement of the Act (1) no further unpaid commissioners should be appointed; (2) the paid commissioners, other than senior commissioners, should be appointed, subject to the approval of the Minister, by the Board of Control and any commissioners so appointed.

Lieut.-Colonel FREMANTLE expressed regret at the abolition of the unpaid commissioners. Such action, he said, would lower the status of the Board.

Miss LAWRENCE said that she could not give a promise on the matter, but she would consult with the Minister in order to see whether a place could not be found for unpaid commissioners among the officers of the Board, but not among the senior commissioners.

Miss PICTON-TURBERVILLE moved an amendment to provide that the officers of the Board should include a woman.

Miss LAWRENCE said that this point would be met on the Report stage.

Lieut.-Colonel FREMANTLE moved that the salary of no commissioner should exceed £3000 per annum. He said that he moved this in order that the Minister might make a statement on the subject.

Miss LAWRENCE assured Colonel Fremantle that the Minister was fully alive to the necessity for giving an adequate, honourable, and attractive salary to the people who would do this important work.

The amendment was negatived.

Clause 11 was added to the Bill.

Clause 12 (Administrative provisions) and Clause 13 (Provision as to the exercise of powers of visitation and inspection) were also added to the Bill.

Transfer of Certain Power from the Minister of Health to the Board of Control.

On Clause 14 Mr. WOMERSLEY moved the following proviso:—

> "Any local authority dissatisfied with any decision of the Board of Control affecting such authority, or with the refusal or withholding of any approval of the Board of Control for which such authority had applied, may appeal to the Minister of Health and any decision or approval given by the Minister on such appeal shall be equivalent to the decision or approval of the Board of Control."

Mr. GREENWOOD, in resisting the amendment, said that it introduced unnecessary machinery into the Bill. No question of general policy was involved under this clause. If such a question arose it would certainly be dealt with by the Minister of Health. The new unification of procedure would bring the Board of Control more directly into contact with the local authorities, but this amendment would drive in a wedge and set the Minister against the Board of Control. That, he was sure, was not the desire of the Committee.

Mr. WOMERSLEY said that he was unrepentent about this matter, and the more he heard it discussed the more he believed in the soundness of the amendment.

The amendment was rejected by 15 votes to 0.

Clause 14 was added to the Bill.

The Committee adjourned.

SHOPS (HOURS OF EMPLOYMENT) BILL.

In the House of Commons on Friday, March 21st, Mr. FREDERICK HALL, in moving the second reading of the Shops (Hours of Employment) Bill, said that the measure provided for a 48-hours week, exclusive of meal times. The shops would be able to keep open for practically the [illegible] hours as at present.

[illegible] R. A. TAYLOR seconded the motion.

[illegible] GERVAIS RENTOUL moved the following amendment:—

> "[illegible] this House declines to give a Second Reading to a Bill [illegible]ld adversely affect the livelihood of a large number of [illegible]ers and shop assistants, would inevitably add to the [illegible]ing, would give rise to widespread evasion, and would [illegible] practical difficulties of administration."

[illegible] CAZALET seconded the amendment.

After further debate,

Dr. ETHEL BENTHAM said that for many years she had been a panel practitioner, having on her list large numbers of men and women engaged in all London trades, and she could say that the health of the shop assistants compared extremely badly with that of people in almost any other trade of which she knew anything. Shop assistants suffered a great deal from varicose veins, flat-foot, and all the disabling things which made life a misery. They aged very early, and broke down very early. With regard to women the matter was even more important and vital. She had no hesitation in saying that the real reasons for these excessively bad conditions of health were to be found in the excessively long hours worked in shops, and the bad ventilation of the premises. There was a greater necessity for protection for this class of worker than for any other within her experience, except perhaps miners.

After further debate,

Mr. A. SHORT (Under Secretary for the Home Office) said that in the view of the Government there was a case for legislation in this connexion, but the information at their disposal was not sufficient to enable them to deal with the situation. They therefore proposed, if the promoters of the Bill were willing, that if the House gave this Bill a second reading an inquiry should be set up on the subject, and the Home Secretary was willing to consult the promoters as to the form and the nature of that inquiry. This was not a device for delay.

Sir G. RENTOUL withdrew his amendment, and the second reading of the Bill was agreed to.

ARMY MEDICAL SERVICE.

On Monday, March 24th, on the motion that the House go into Committee on the Army Estimates for 1930,

Mr. T. SHAW (Secretary of State for War) expressed his regret that there was a shortage of medical men who were prepared to undertake a career in the army. Although the physical tests had been scaled down, the army as a whole was still under establishment. Out of a total of 72,268 recruits who presented themselves for enlistment in 1929, 28,131, or 39 per cent., were accepted, which meant that 61 out of 100 were rejected even on the standards now insisted on. Of the rejections, 91 per cent. were on physical and medical grounds. The lowering of the dental standard, which had previously been tried in Scotland, was extended to England and Northern Ireland, and by that means an additional 2384 recruits were enlisted for all arms. In December, 1928, the height standard for the infantry lines was lowered to 5 feet 2 inches, and 907 young men of suitable physical development were enlisted. By those measures 3219 recruits were accepted who would otherwise have been lost to the service. Without them, the intake for 1929 would have been only 24,840. The physical condition of the young men who presented themselves was a very serious matter, and he was asking his staff to investigate, so far as they could, how far that physical deterioration was due to industrial depression or to other causes.

WORKMEN'S COMPENSATION (SILICOSIS) BILL.

In the House of Lords on Tuesday, March 25th, Earl RUSSELL introduced the Workmen's Compensation (Silicosis) Bill, which was read a first time.

HOUSE OF COMMONS.

THURSDAY, MARCH 20TH.

Teaching of Hygiene in Elementary Schools.

Sir JOHN GANZONI asked the President of the Board of Education whether he was aware that the chief medical officer of the Board had asked the school medical officers throughout the country to submit to him a report upon the teaching of hygiene in public elementary schools; and if the right hon. gentleman would give directions that in future the local education authority and not its officers should be requested to furnish such reports.—Sir CHARLES TREVELYAN replied: There has been some misunderstanding in regard to the circular referred to. It has, however, been made clear by a subsequent communication to the school medical officers that the inquiry was concerned with the medical effect of the teaching of hygiene in the schools. It has been a practice of many years' standing for the chief medical officer to communicate directly with his colleagues in the school medical service in regard to questions on which their professional opinion is desired.

The Ringlemann Smoke Test.

Dr. HASTINGS asked the Minister of Health whether he would be prepared to approve by-laws under Section 2, Subsections (1) and (2), of the Smoke Abatement Act, 1926, defining noxious smoke as smoke of some specified density as measured by the Ringlemann test, which had been used for many years in the United States of America.—Mr.

Greenwood replied: I am aware that in some places in the United States this test has been used, but no local authority in this country has proposed to embody it in by-laws under the Act of 1926 and, as at present advised, I do not think it is suitable for that purpose.

Cardiff City Council and the Schick Test.

Mr. Freeman asked the Minister of Health whether his attention had been called to a proposal of the Cardiff city council to perform the so-called Schick test and inoculate 10,000 healthy children who were under 10 years of age; and, seeing that it was impossible to give an assurance that the immunisation of such a number of children would greatly reduce the incidence of diphtheria and that no compensation was payable, would he see that parents and guardians were informed in writing at least one month before such operations were allowed to take place, and permission in writing was obtained to proceed with the operation on behalf of each child beforehand.—Mr. Greenwood replied: I am aware that this council has offered to protect about 10,000 children against diphtheria by a process of immunisation. I understand that it is the practice of the council to allow parents a reasonable period in which to decide whether they will accept the offer, but that it is not administratively convenient to give as long notice as one month. Permission in writing is obtained from the parent or guardian of each child before it is treated under the arrangements made by the council.

Medical Officers and Municipal Disabilities.

Lieut.-Colonel Fremantle asked the Minister of Health if he would introduce a short indemnifying Bill to exempt present sitting medical members of county and county borough councils from their disabilities to act as from April 1st next during the remainder of their present period of office, pending the reconsideration or reorganisation of the methods of payment to medical practitioners for minor medical services rendered on behalf of local authorities in the course of their private practice.—Mr. Greenwood replied: I regret that I am not able to comply with the suggestion.

Lieut.-Colonel Fremantle asked the Minister of Health if he was aware that in rural parts of the country generally, and particularly in such rural counties as the county of Huntingdon, all practising medical practitioners were rendered ineligible for service as members of county councils by the provisions of the Local Government Act, 1929, and that, therefore, such councils as desire to have medical members, whether coöpted or elected, for their public health, maternity and child welfare, and Midwives Acts, mental deficiency and other committees, were unable to obtain them; and would he take this question into consideration.—Mr. Greenwood replied: Legislation would be required to deal with the matter raised by the hon. and gallant Member, and I am afraid that I can give no undertaking as to such legislation.

Lieut.-Colonel Fremantle: If a one-clause Bill is introduced to remove any inconvenience temporarily, and enable these officers to carry out their duties during the remainder of their term of office, which is obviously desired by the electorate, will the right hon. gentleman try to give facilities for its passage?

Mr. Greenwood: There are only 11 days to go before the new Act comes into operation, and the local authorities have already made their arrangements.

Lieut.-Colonel Fremantle: A great deal can be done in that time.

The Royal Veterinary College.

Captain Crookshank asked the Minister of Agriculture if he could make any statement regarding the Royal Veterinary College.—Mr. Buxton replied: The Development Commissioners have recommended, and the Treasury has approved the recommendation, that, subject to certain conditions, a grant not exceeding £100,000, on a pound-for-pound basis, should be made to the Governors of the Royal Veterinary College for the reconstruction of the College on the present site.

The Hospital at Kuala Lumpur.

Mr. Wellock asked the Under Secretary of State for the Colonies when it was proposed to complete the hospital at Kuala Lumpur; and what sum had been allocated to this purpose in the current estimates by the Government of Malaya.—Dr. Shiels replied: I understand that plans for the new hospital are now under consideration, and though it is possible that the work of construction may begin in 1931, no date has been fixed for completion. No provision has been made in the current estimates.

General Medical Council and Indian Degrees.

Mr. Freeman asked the Secretary of State for India whether his attention had been called to the fact that Indian medical degrees were not recognised by the British Medical Council; and if he proposed to take any action in the matter.—Mr. Wedgwood Benn replied: I am aware that the General Medical Council have withheld recognition of Indian degrees. I am in communication with the Government of India on the subject, and am not at the moment prepared to make any statement. I need hardly say that I am most anxious that a settlement should be reached.

Medical Officers in the Navy.

Dr. Vernon Davies asked the First Lord of the Admiralty if he would give, for each of the last 10 years for which statistics were available, the total number of medical officers in the navy, and the number who joined and the number who left the service in each year.—Mr. Ammon (Parliamentary Secretary to the Admiralty) replied: The figures are as follows:—

Year.	Total medical officers.	Entered.	Retired, &c.	Year.	Total medical officers.	Entered.	Retired, &c.
1920	454	24	29	1925	390	29	32
1921	429	12	37	1926	390	30	30
1922	415	24	38	1927	381	37	46
1923	392	14	37	1928	390	45	36
1924	393	33	32	1929	372	19	37

The total numbers of medical officers are those arrived at by the end of each year. Temporary surgeons entered during the war have not been included, and none are now serving.

Medical Officers in the Royal Air Force.

Dr. Vernon Davies asked the Under Secretary of State for Air if he would give for each of the last ten years for which statistics were available the total number of medical officers in the service, the number who joined, and the number who left the service in each year.—Mr. Montague replied: The following are the figures required in respect of the years for which statistics are available:—

Year beginning April 1st.	Strength beginning of year.	Joined during year.	Left during year.	Year beginning April 1st.	Strength beginning of year.	Joined during year.	Left during year.
1921	119	32	18	1926	188	21	25
1922	133	45	13	1927	184	29	20
1923	165	29	15	1928	193	17	20
1924	179	27	19	1929	190	17*	20*
1925	187	22	21				–

* Figures to date, March 19th, 1930.

Monday, March 24th.

Indian Medical Degrees.

Lieut.-Colonel Fremantle asked the Secretary of State for India if his attention had been drawn to the action of the Indian university authorities which prevented the General Medical Council from being in a position to guarantee the standard of Indian medical degrees and to recognise them for registration on the general medical register: if he was aware that such action would bar future holders of these degrees from the main field of medical practice outside India: and if he would take steps to ensure a reasonable settlement of the question at an early date.

Major Graham Pole asked the Secretary of State for India what action the Government of India proposed to take following the refusal of the British Medical Council to extend recognition to Indian medical degrees; and whether it was now the intention of the Government of India to introduce into the assembly during the present session legislation embodying proposals for the early establishment of an All-India Medical Council.—Mr. Wedgwood Benn replied: I explained the general position in reply to Mr. Freeman on March 20th. I am aware that the decision of the General Medical Council will prevent holders of Indian medical degrees gained during the period of non-recognition from practising in this country. The Government of India informed me on Jan. 6th that they did not expect to be able to introduce legislation for the establishment of a General Medical Council in India during the present session of the Indian Legislative Assembly, and I have not heard from them since on this point.

Lieut.-Colonel Fremantle asked if the right hon. gentleman was taking steps to ask the Government of India if they would agree provisionally to make arrangements so that Indian gentlemen who were qualifying for practice during the next six or twelve months might not be finally and for the rest of their lives debarred from practice?

Mr. BENN said that those were naturally matters on which he was consulting the Government of India.

Dr. VERNON DAVIES asked if Mr. BENN was aware that the cause of the dispute was the alleged statement that the training of the Indian medical gentlemen was not considered sufficient.

Mr. BENN said that it would not be suitable, in reply to a supplementary question, to deal with the whole question of medical training.

TUESDAY, MARCH 25TH.

Indian Medical Research Institute.

Major GRAHAM POLE asked the Secretary of State for India what was the present position in respect of the proposal of the Government of India to remove the Indian Central Medical Research Institute to Debra Dun.—Mr. WEDGWOOD BENN replied: I am sending my hon. friend a copy of a debate in the Indian Legislative Assembly on Feb. 8th from which he will see that the decision to locate the Institute at Debra Dun is to be reconsidered.

Obituary.

JOHN GREGORY WHITE, M.D. EDIN.

Dr. Gregory White, so long a leading practitioner in Bournemouth, died at Aspley Guise, Bedfordshire, on Feb. 11th, at the advanced age of 92. An Edinburgh student in the 'fifties he qualified in 1862, and held resident appointments at the Leith Casualty and Fever Hospitals before settling at Bournemouth, where for many years he had a large and varied practice. The district was then developing rapidly as a winter resort for invalids, among whom Dr. White found scope for his sagacity and practical skill in treatment, combined with the kindliness and patience to which one of his colleagues bears witness. On his retirement in 1907 he went to live at Aspley Guise, where he had inherited property, leaving his practice to his son, Dr. Edward How White. His wide intellectual interests acquired for him a large circle of friends in Bedfordshire, among whom his death is greatly regretted; and there are still many among the senior members of the profession, and of the older residents of Bournemouth, who cherish his memory with affection.

RICHARD HERBERT VERCOE, B.A. CAMB., M.R.C.S. ENG., D.P.H.

Dr. Vercoe, who died at Chelmsford on March 23rd n his fiftieth year, was medical officer of health and school medical officer to the borough. After graduating at Cambridge, Dr. Vercoe continued his medical studies at University College, London, and took the conjoint qualification in 1910. He then held a series of resident appointments at the Prince of Wales's Hospital, Tottenham, and was clinical assistant at the Brompton Hospital. During the war he served n the R.A.M.C., gaining special experience of trench fever, on which he contributed an appendix to Byam's monograph. After taking the diploma in public health at Oxford he was appointed school medical officer at Colchester, where he made a study of the health of school-children in relation to their position in the family which excited a lively correspondence in our own columns. At Chelmsford much of his spare time was occupied with an investigation into the incidence of rheumatism in the school population and the relative importance of heredity and home environment. The mayor of Chelmsford has testified to his value and efficiency as a health officer.

ENLARGEMENT OF CHESTERFIELD HOSPITAL.—The waiting-list being now in excess of 500 it has been decided to erect a new ward at a cost, including equipment, of about £17,000. The basement is to be converted into an eye, ear, and throat department with a small theatre The money for these extensions is in hand, thanks to a egacy of £10,000 and the receipt of £1514 from a carnival.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates passed in the undermentioned subjects:—

Surgery.—J. Gordon, T. C. Keble, A. R. Madden, and C. J. Nicol, St. Mary's Hosp.; S. E. Paterson, Edinburgh; A. Scher, London Hosp.; E. M. M. Shaw, Westminster Hosp.; C. Skinner, Guy's Hosp.; and L. J. P. Soromenho, Lisbon and St. Bart.'s Hosp.

Medicine.—T. Chandrasekharan, Madras and Manchester; H. C. Halge, St. Mary's Hosp.; A. Hamid, Middlesex Hosp.; E. G. Nair, Madras and Manchester; R. Nandlal, Birmingham; M. S. Rappoport, London Hosp.; T. Singh, Charing Cross Hosp.; and G. K. Wilsker, Liege and Royal Free Hospital.

Forensic Medicine.—K. Graftdyk, Leeds; H. C. Halge, St. Mary's Hosp.; A. Hamid, Middlesex Hosp.; B. T. W. Harvey, London Hosp.; E. Jacomb, Charing Cross Hosp.; M. S. Rappoport, London Hosp.; and T. Singh, Charing Cross Hosp.

Midwifery.—E. A. Freywirth, Heidelberg and Westminster Hosp.; K. Graftdyk, Leeds; J. M. L. Love, St. Mary's Hosp.; L. R. C. Rose, Manchester; Grantley Smith, Bristol and Guy's Hosp.; and L. C. H. Sykes, Leeds.

The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery: T. Chandrasekharan, J. Gordon, K. Graftdyk, H. C. Halge, A. Hamid, B. T. W. Harvey, R. Nandlal, M. S. Rappoport, A. Scher, T. Singh, C. Skinner, and L. J. P. Soromenho.

UNIVERSITY OF LIVERPOOL.—At recent examinations the following candidates were successful:—

M.CH.ORTH.

M. G. Kini and D. W. L. Parker.

FINAL EXAMINATION FOR M.B. & CH.B.

Part I. (1923 regulations).—A. M. Russell.

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.

Part A.—A. J. Galustian, J. M. Grieve, G. W. Phillips, R. Y. Stones, and T. M. Tso.

Part B.—A. J. Galustian, J. M. Grieve, M. J. McHugh, G. W. Phillips, R. Y. Stones, and T. M. Tso.

DIPLOMA IN PUBLIC HEALTH.

Part I.—J. H. St. B. Crosby, H. R. Dugdale, H. P. Fowler, J. D. A. Gray, E. Hughes, H. S. Lawrence, J. S. Mather, E. S. R. Menon, J. W. Pickup, W. J. Pierce, J. H. Pottinger, and Nora M. Wilson.

DIPLOMA IN TROPICAL MEDICINE.

G. R. Baxter, C. J. Boyd, J. A. K. Brown, A. Cathcart, T. T. M. Chen, Ariel R. S. Deacon, J. H. Dobbin, F. D. Gillespie, S. C. Grant, R. Green, M. L. Gulatee, R. A. Heatley, B. N. Khanna, D. K. L. Lindsay, J. E. D. Mendis, M. B. Mody, G. B. Mobile, S. Narain, C. J. Poh, L. Sumitra, and T. Wilson.

DIPLOMA IN TROPICAL HYGIENE.

R. A. Anderson, C. G. Booker, W. A. Bullen, R. Krishna, C. N. Latham, J. E. McMahon, and A. Reid.

UNIVERSITY OF DUBLIN.—At recent examinations in the School of Physic, Trinity College, Dublin, the following candidates were successful:—

M.D.

Wentworth Alexander Taylor.

M.CH.

Gibbon FitzGibbon.

FINAL MEDICAL EXAMINATION FOR M.B., B.CH. & B.A.O.

Part I., Materia Medica, Medical Jurisprudence, Pathology, &c.—*J. A. Wallace, E. F. Burton, P. C. Cosgrove, J. B. Fleming, T. M. R. Ahern, N. H. Leask, H. B. Wright, D. H. S. Boyd, W. A. Hill, H. J. Garland, J. G. Wilson, H. S. Mason, and H. St. G. Smith.

Part II., Medicine.—W. I. Chapman, John Willoughby, Samuel Levy, F. P. FitzGerald, and P. L. O'Neill. *Surgery.*—F. O. Pilkington, R. T. O'Shea, R. E. Hemphill, F. M. Lyons, Arnold Rose, G. F. West, Reginald Bowesman, Patrick O'Shea, E. F. St. J. Lyburn, and Annie E. Thompson *Midwifery.*—*S. H. Moore, *N. A. Kinnear, D. J. O'Ryan, T. A. Bouchier-Hayes, W. A. Robinson, C. H. Adderley, E. S. Duthie, C. H. Hutchinson, C. M. Elliott, Charles Ryan, J. B. Scott, and H. W. Dalton.

DIPLOMA IN GYNÆCOLOGY AND OBSTETRICS.

H. M. Fisher, E. T. Mankabadi, Lin Yang, and M. H. Rashwan.

* Passed on high marks.

MANOR HOUSE ORTHOPÆDIC HOSPITAL.—The first sod of the site of the new Manor House Hospital at Golders Green has been cut. The buildings and their equipment will cost £250,000, all of which, with the exception of £22,000, is in hand, and when completed there will be accommodation for 350 patients; there are at present 105 beds. The first of the new permanent buildings will cost £20,500. The hospital is [illegible] the Industrial Orthopædic Society for the [illegible]rial workers.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.—The annual congress to be held at the House of the Royal Society of Medicine on Thursday, Friday, and Saturday, April 3rd, 4th, and 5th, under the presidency of Mr. Leslie Paton, is a Jubilee meeting, as the Society was founded in 1880. The following interesting programme has been arranged:

Thursday, 10 A.M. to 12.30 P.M.: Presidential Address, Presentation of the Nettleship Medal. Papers: Mr. E. Treacher Collins, The Harderian Gland, Xerophthalmia, Vitamin A Deficiency, Keratomalacia. Mr. Aykroyd, Night-blindness due to Vitamin Deficiency. Dr. Collier, Ocular Paralyses. Mr. Chavasse, An Examination of Existing Theories of Concomitant Convergent Strabismus, together with Some Observations on the Antiquity of Stereopsis. 2.30 P.M.: Discussion—Disorders of Secretion of the Endocrine Glands Associated with Eye Diseases. Openers: Mr. J. H. Fisher, Prof. H. MacLean, Dr. W. Clark Souter, and Prof. Dodds. The following will take part in the discussion: Messrs. A. W. Ormond, C. Goulden, and others. 9 P.M.: Reception by the President and Council of the Royal College of Surgeons at the College, Lincoln's Inn Fields, W.C.

Friday, 9.30 A.M. to 12.30 P.M.: Papers—Mr. G. F. Alexander, (1) Discission of After-Cataract. (2) An Operation for Aggravated Ectropion. Prof. Van der Hoeve, The Eye and Amnion Bands. Prof. G. Marquez, La Theorie Stereoscopique der Anaglyphes. Dr. Gordon Holmes, Spasm of Fixation. Mr. Ridley, Experimental Investigation into the Intra-Ocular Pressure and the Drainage of the Aqueous. Mr. Doggart, Ocular Rosacea. Mr. Greeves, X Ray Applications in Superficial Keratitis. 2.30 P.M.: Papers—Mr. Juler, Some Cases of Damage to Descemet's Endothelium. Mr. Tudor Thomas, Transplantation of the Cornea (with Demonstration). Dr. Mulock Houwer, The Ætiology of Retention Cysts of the Fornix Conjunctivæ. Mr. Duke-Elder, New Observations on the Physiological Action of the Extra-Ocular Muscles. 4.30 P.M.: Tea. 5 P.M.: The Bowman Lecture—Sir Arthur Keith. The Genius of Bowman. 7.30 for 8 P.M.: Banquet at the Fishmongers Hall, London Bridge, E.C., by courtesy of the Prime Warden and Court. The price of the ticket is £1 15s., and cheques should be sent to Mr. M. H. Whiting, 51, Wimpole-street, London, W.

Saturday, 9.30 A.M.: Papers—Dr. Rosa Ford, The Advantage of Using the Elliot Scotometer at Two Metres. Dr. Adie, Acute Retrobulbar Neuritis in Disseminated Sclerosis. Sir Arnold Lawson, A Further Note on a Case of Bilateral Symmetrical Detachment of the Retina with 6/5 Vision. Mr. Bernard Cridland, Comments on the Certified Causes of Blindness. Miss Ida Mann, The Reptilian Iris. Mr. Basil Graves, Spasmodic Ectropion. 12 noon: Annual Meeting of the Society. 12.30 P.M.: Meeting of British Ophthalmologists. Afternoon: Visit to the Zoological Gardens. Demonstration of Pythons' Eyes with the Slit-Lamp, by Miss Mann. 4.15 P.M.: Tea in the Fellows' Pavilion.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—An election of three Fellows into the Council will take place at the College in July, the vacancies being occasioned by the retirement in rotation of Mr. R. P. Rowlands, Sir Percy Sargent, and Mr. Victor Bonney, who are all eligible for re-election.

UNIVERSITY OF MANCHESTER.—At a recent examination the following candidates were successful:—

DIPLOMA IN PUBLIC HEALTH.

Part II.—Arnold Brown and J. S. Sewell.

A consultative committee on cancer research, consisting of representatives of the University and of the Manchester Committee on Cancer, including the Christie Hospital and the Radium Institute, has been established. The work will be done at the University laboratories, and will be directed and controlled by the Consultative Committee. Dr. C. C. Twort, who has been working under the direction of the Manchester Committee on Cancer, has been appointed as Director of the Department of Cancer Research.

Mr. John Morley has been appointed lecturer in systematic surgery.

UNIVERSITY OF LEEDS.—The Council has decided to institute a readership in clinical chemical pathology, and Dr. F. S. Fowweather, at present lecturer in chemical pathology, is to be promoted to it. Mr. B. L. Jeaffreson has been appointed tutor in obstetrics and gynæcology, and Dr. J. J. Thomson demonstrator in pathology and bacteriology.

UNIVERSITY OF SHEFFIELD.—The Council of the University has appointed Mr. Graham Simpson to be professor of surgery in succession to Prof. A. M. Connell, who retires from office on March 31st. Mr. Simpson is Senior Surgeon to the Sheffield Royal Hospital.

DEPARTMENT OF HEALTH FOR SCOTLAND.—Dr. Peter L. McKinlay has been appointed a medical officer in this department. A graduate of Glasgow University he was at one time assistant medical statistician to the Scottish Committee upon Problems of Child-life, and for the last five years has been medical statistician on the staff of the Medical Research Council. He has also acted as visiting lecturer to the Division of Vital Statistics and Epidemiology in the London School of Hygiene and Tropical Medicine, and as secretary to the committee on miners' nystagmus.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—The meeting of the Maternity and Child Welfare Group, fixed for to-day, Friday, March 28th, is postponed until further notice.

ROYAL STATISTICAL SOCIETY.—The Council of this society will again, in 1931, award a Frances Wood memorial prize, value £30, for the best investigation, on statistical lines, of any problem affecting the economic or social conditions of the wage-earning classes.

CITY OF LONDON MATERNITY HOSPITAL.—The Lord Mayor, who last week presided in state over the annual court of governors, stated that the training school had taught 9355 midwives and 15,824 maternity nurses. The rebuilding of the nurses' home, at a cost of £30,000, is said to be overdue.

NORTH MIDDLESEX HOSPITAL.—Last week Mr. Greenwood (Minister of Health) opened the new radium department of this Edmonton hospital, and laid the foundation-stone of an extension of the nurses' home. He remarked that the Local Government Act which is about to come into operation had been passed "with the general approval of public opinion."

POST-GRADUATE COURSES AT DUBLIN.—Arrangements are being made for a three weeks' post-graduate course, on the same lines as in former years, to be held at Trinity College, Dublin, from Sept. 15th to Oct. 4th. A limited number of members of the class can be accommodated in College rooms, or, in the case of women, at Trinity Hall.

CROWDED MENTAL HOSPITALS.—The Corporation of Southend have decided to send the excess of the borough's mental patients to mental hospitals at Exeter and Newcastle-on-Tyne. This action has been caused by the refusal of the committee of the Essex Mental Hospitals to receive more than 175 patients from Southend. The corporation applied to authorities all over the country in the hope of obtaining accommodation, but of the 20 that replied only Exeter and Newcastle had vacancies.

ANCOATS HOSPITAL EXTENSION.—At the centenary, two years ago, of this hospital in the heart of the industrial centre of Manchester, the accommodation was described as "hopelessly inadequate." But the appeal then launched for £100,000 for extensions and improvements has produced only £33,000, and the scheme has therefore had to be seriously modified, and one new block of four wards only will be built. There are at present 114 beds, which it had been hoped to increase to 200, though at least 300 are needed. The number of operations has almost doubled since 1925.

PUBLIC ASSISTANCE IN THE COUNTY OF LONDON.—In accordance with schemes prepared by the Public Assistance and Public Health Committees, the London County Council has allocated the 12 poor-law hospitals which it will take over on April 1st to the five areas into which the capital has been divided for the purpose. In addition, the Council will administer the Queen's Hospital, Sidcup, and Tooting Home Hospital, neither of which is at present in use as a hospital. The Public Health Committee record their belief that "the present available accommodation for the acute sick will be inadequate for future needs."

"HYGIENIC RIGHTEOUSNESS."—At the annual meeting last week of the Royal Hospital, Wolverhampton, Mr. N. B. Graham, the chairman, suggested that patients and prospective patients should be gathered together in the out-patients' hall and instructed in "hygienic righteousness." Last year the average stay in the hospital (5010 patients) was 14·7 days, the cost per head £6 12s. 8½d., an increase of 3s. 2¼d., and per occupied bed £163 15s. 11d., an increase of more than £24 over two years ago. The cost per head at the Women's Hospital was £8 18s. 5½d., and per occupied bed £225 4s. 5½d., a slight increase.

GERMAN SPA CONGRESS.—The Balneological Society of Berlin is arranging to hold its forty-fifth Congress in Bad Elster, Saxony, from April 9th to 13th, under the presidency of Prof. Dietrich. The chief themes for discussion will be the action of iron in medicinal waters, the examination of peat and mud baths, and the dietetics of health resorts. Members will have an opportunity of visiting the University clinics in Leipzig before the congress, and the radium baths at Brambach and Oberschlema afterwards, as well as the sanatoria at Reiboldsgrün and Carolagrün. There is no membership fee and non-members are welcome. Further information from Dr. Max Hirsch, Berlin, W.35, Steglitzerstr. 66.

Manchester Students' Rag.—The Shrove Tuesday "Rag" of the students of the University yielded £10,927, somewhat less than last year's figure, which was £11,013. Street collections raised £1680, and the sale of the "Rag Rag" £5100. Cheques for £1000 apiece have been sent to the Dental Charities' Fund, to the Cancer Research Appeal Fund, and to the Manchester Northern Hospital for Women and Children; the balance goes to the Manchester and Salford Medical Charities' Fund.

"Plymouth Royal Hospital."—It was formally announced at the annual meeting of the South Devon and East Cornwall Hospital that it has now been decided that this institution, the Central, and Royal Albert Hospitals, are to be amalgamated under the above title. A Royal Charter is to be applied for. The South Devon and East Cornwall Hospital is in debt to the bank to the extent of £22,000, and it appears that there is not a grain of radium for hospital use in *Plymouth. The South Devon last year* spent £1000 on treating motor accidents and recovered only £80.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, April 1st.—5.30 p.m., Orthopædics. (Cases at 4.30 p.m.)

Wednesday.—5 p.m., History of Medicine. Papers: Prof. Tom Hare: Two XVIth Century Veterinary Books. Dr. A. P. Cawadias: Epidauros; Some New Photographic Documents. Demonstration: Dr. G. C. Peachey: Frank Buckland at Home. 8.30 p.m., Anæsthetics. Reception at the Wellcome Historical Medical Museum. *During the evening the Rt. Hon.* Lord Dawson of Penn will give an address on Henry Hill Hickman. 8.30 p.m., Surgery. Discussion on Amputations and their Relation to the Artificial Limb. Opener: Mr. C. Max Page. Followed by Mr. P. Jenner Verrall, Dr. R. D. Langdale-Kelham, Captain A. R. Maxwell and others. Illustrative cases will be shown.

Thursday.—8.30 p.m., Tropical Diseases. Paper: Dr. G. W. Theobald: Women, Malaria, and Quinine. Obstetrics and Gynæcology. Members of this Section are specially invited to attend.

TUBERCULOSIS ASSOCIATION. Provincial Meeting at Oxford.

Thursday, April 3rd.—2.30 p.m., The Examination of Contacts. Speakers: Dr. G. Jessel, Dr. N. Bardswell, and Dr. W. Burton Wood.

Friday.—10 a.m., Oleothorax. Speaker: Dr. Gilbert. Demonstrations of Apparatus. 2 p.m., The Economics of Tuberculosis Settlements. Speakers: Dr. P. C. Varrier-Jones, Dr. J. B. McDougall.

Saturday.—10 a.m. (1) Annual General Meeting. (2) Preliminary Reports on Experiences with Turtle-vaccine Therapy. Dr. Fowler and others. (3) Demonstration of Apparatus. The meetings will be held in the Pathological lecture room of the Dunn Laboratory.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, March 31st, to Saturday, April 5th.—Prince of Wales's Hospital, Tottenham, N. Special one week's course in Gastro-Enterology, occupying from 10.30 to 5.30 each day with clinical lectures, demonstrations, operations.—Royal Waterloo Hospital, Waterloo-road, S.E. Special Post-graduate Course in Medicine, Surgery, and Gynæcology. Operations and lecture-demonstrations in the Wards and Out-Patient departments.—West End Hospital for Nervous Diseases, 73, Welbeck-street, W. Special Post-graduate Course of lectures and clinical demonstrations. Daily at 5 p.m.—Further particulars from the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

Monday, March 31st.—2.30 to 5 p.m.: Medical, Surgical, and Gynæcological Clinics. Operations.

Tuesday, April 1st.—2.30 to 5 p.m.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.

Wednesday.—2.30 to 5 p.m.: Medical, Skin, and Eye Clinics. Operations.

Thursday.—11.30 a.m.: Dental Clinics. 2.30 to 5 p.m.: Medical, Surgical, Nose, Throat, and Ear Clinics. Operations.

Friday.—10.30 a.m.: Throat, Nose, and Ear Clinics. 2.30 to 5 p.m.: Surgical, Medical, and Children's Diseases. Clinics. Operations.

CITY OF LONDON MATERNITY HOSPITA

Tuesday, April 1st.—5 p.m., Mr. R. The Treatment of Disproportion.

CENTRAL LONDON THROAT, NOSE AND EA

Friday, April 4th.—4 p.m., Mr. A. Lownde and Subacute Labyrinthitis.

ROYAL DENTAL HOSPITAL OF LONDON, Leicest W.C.

Wednesday, April 2nd.—6 p.m., Mr. F. P. de Caux: Re Advances in the Methods of Administering N_2O in the Surgery of the Mouth.

ANCOATS HOSPITAL POST-GRADUATE COURSE, Mill-street, Manchester.

Thursday, April 3rd.—4.15 p.m., Dr. N. Kletz: Affections of the Kidneys with Special Reference to Nephritis.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

Tuesday, April 1st.—4.15 p.m., Mr. P. R. Wrigley: The Investigation and Treatment of Enlargement of the Prostate.

Friday.—4.15 p.m., Mr. J. P. Buckley: Demonstration of Surgical Cases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

Wednesday, April 2nd.—4.15 p.m. (Victoria Infirmary), Dr. R. M. Marshall: Medical Cases.

Appointments.

Certifying Surgeons under the Factory and Workshop Acts: Smart, J., M.B., Ch.B. Glasg. (Dunoon, Argyll); and Duckworth, H. L. D., M.B., B.Ch. Dub. (Ross, Hereford).

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne, District Infirmary.—Res. Surg. O. At rate of £200.
Barnsley, Beckett Hospital and Dispensary.—Cas. O. £250.
Bath Royal United Hospital.—H.S. At rate of £150. Also H.P. £120.
Bedford County Hospital.—H.S. At rate of £175.
Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.S. Also Asst. H.P. Each at rate of £100.
Blackburn, Royal Infirmary.—4th H.S. £150–£200.
Cambridge, Addenbrooke's Hospital.—H.S. At rate of £130.
Charing Cross Hospital, W.C.—Asst. Physician.
Connaught Hospital, Orford-road, E.—Sen. Res. H.S. At rate of £150. Also Jun. Res. H.S. At rate of £100.
Derby, Bretby Hall Orthopædic Hospital, nr. Burton-on-Trent. Asst. M.O. At rate of £150.
Derby, Derbyshire, Royal Infirmary.—H.P. £150.
Doncaster Royal Infirmary.—Hon. Phys. and Path. Hon. Ear, Nose and Throat S. Also Two Hon. Anæsthetists.
Downpatrick, Down Mental Hospital.—Jun. Asst. M.O. £300.
Dundee Royal Infirmary.—Two Asst. Visiting M.O.'s
Durham County Hospital.—Jun. H.S. £120.
Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £150.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—H.S. At rate of £135.
Guildford, Royal Surrey County Hospital.—H.S. £150.
Hertford County Hospital.—Res. Surg. O. At rate of £250.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. £50 for six months. Jun. H.P. At rate of £100.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. Also H.P. At rate of £150 and £100 respectively.
Hospital for Sick Children, Great Ormond-street, W.C.—Res. M.O. for County Branch Hospital, Tadworth, Surrey. At rate of £250.
Hove Hospital, Sackville-road.—Res. M.O. £150.
Hove, Lady Chichester Hospital.—Jun. H.P. At rate of £50.
Hull Royal Infirmary.—H.S. Also Cas. H.S. At rate of £150 and £130 respectively.
Ilford Borough.—Part-time Asst. M.O.H. for Infant Welfare Centres. £1 11*s.* 6*d.* per session.
Lincoln County Hospital.—Jun. H.S. At rate of £150.
Liverpool, Royal Children's Hospital.—Res. H.S. At rate of £60.
London Jewish Hospital, Stepney Green, E.—Med. Reg. and Out-patient Asst. At rate of £150. Also Clin. Asst.
London Lock Hospital, 91, Dean-street, W.—1st and 2nd H.S.'s. Each at rate of £200.
London Temperance Hospital, Hampstead-road, N.—Res. M.O. Also H.P. At rate of £175 and £100 respectively.
Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Jun. Res. M.O. At rate of £50.
Manchester Ear Hospital, Grosvenor-square, All Saints.—H.S. At rate of £150.
Manchester Royal Infirmary.—H.S. to Special Departments. At rate of £50.
Manchester, Victoria Memorial Jewish Hospital, Cheetham.—Hon. Radiologist.

OPHTHALMOLO*ital, Kingsland-road, E.*—Sen. H.P., Sen. H.S., KINGDOM.—The r Jun. H.S. Also Two Cas. O.'s. All at rate of the Royal Socie*k and Norwich Hospital.*—H.S. to Special Depts. Saturday, April. and H.S. Each £120.

Mr. Leslie Pato*ien Children's Hospital, London, W.*—H.P. and founded in 18*sen* at rate of £150.

been arrang *County of Lancaster Royal Infirmary.*—Pathologist.

Thurs*of Wales's General Hospital, Tottenham, N.*—Hon. Phys. Prese Also Sen. H.P., Sen. H.S., and Special H.S. Each at rate Co of £120. Also Jun. H.P., and Two Jun. H.S.'s. Each at rate of £90.

Princess Louise Kensington Hospital for Children, North Kensington.—H.P. At rate of £75.

Queen Mary's Hospital for the East End, E.—House Anæsthetist and H.P. £120.

Rampton State Institution for Mental Defectives, near Retford, Notts.—4th M.O. £547 10s.

Royal Air Force Medical Service.—Vacancies for Medical Officers.

Royal Chest Hospital, City-road, E.C.—Res. M.O. Also H.P. At rate of £150 and £100 respectively.

Royal Dental Hospital of London, 32 Leicester-square, W.C.—Hon. Asst. Anæsthetist.

Royal Free Hospital, Gray's Inn-road, W.C.—Cas. O. At rate of £150. Also Res. Anæsthetist.

Royal Northern Hospital, Holloway-road, N.—Pathologist. £750. Also Asst. Pathologist. £500.

St. Andrew's Hospital, Dollis Hill, N.W.—Sen. and Jun. Res. M.O.'s.

St. Bartholomew's Hospital, E.C.—Three Asst. Dental Surgeons.

St. Mary's Hospital for Women and Children, Plaistow, E.—Asst. Res. M.O. At rate of £120. Also Clin. Asst. for Medical Out-patients Dept.

Salford Royal Hospital.—H.P. Also Cas. H.S. Each at rate of £125.

Shanghai Municipal Council, P.H. Dept.—Asst. Pathologist. 650 Taels per mensem.

Southampton Borough Hospital.—Res. Med. Supt. £600.

Southampton, Royal South Hants and Southampton Hospital.—Cas. O. At rate of £130 to £160.

Surrey Local and Medical and Panel Committee.—Secretary.

University College Hospital Medical School, W.C.—Chair of Bacteriology. £1200.

Wakefield, Clayton Hospital.—Two H.S.'s. Each at rate of £150.

Walsall General Hospital.—Cas. H.S. At rate of £120.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. Res. H.S. Also Jun. H.S. At rate of £150 and £100 respectively.

Westminster Hospital, Broad Sanctuary, S.W.—Hon. Administrator of Anæsthetics.

The Home Secretary is considering the appointment of an additional Medical Referee under the Workmen's Compensation Act, 1925, for the Districts of the Barry and Cardiff County Courts (Circuit No. 24). Applications should reach the Private Secretary, Home Office, Whitehall, London, S.W. not later than April 12th.

Births, Marriages, and Deaths.

BIRTHS.

MONTEITH.—At 7, South-street, St. Andrews, Fife, on March 20th, to Margaret (*née* Evans), the wife of W. B. R. Monteith, F.R.C.S. Ed.—a daughter.

STEVENSON.—On March 20th, at The White House, Victoria-road, Colchester, the wife of Major W. B. Stevenson, R.A.M.C., of a daughter.

SUMMERSKILL.—On March 15th, at Bentinck-street, W., the wife of Dr. W. H. Summerskill, of a son.

MARRIAGES.

CROSSKEY—WEAVER.—On March 19th, at St. Oswald's Church, Hinstock, Market Drayton, Lionel Howard, M.B., Ch.B., of Kidderminster, to Emily Booth, second daughter of Mr. and Mrs. J. B. Weaver, of Hinstock.

DEATHS.

FAGAN.—On March 17th, at Graigue-a-Verne, Portarlington, Sir John Fagan, D.L., F.R.C.S.I., aged 86.

FORAN.—On March 22nd, at Eastbourne, John Cyril Foran, J.P., L.D.S., in his 78th year.

JENNINGS.—On March 13th, Charles Egerton Jennings, M.D., F.R.C.S., of Filands, Malmesbury.

NIXON.—On March 19th, Constantia Adriana, elder daughter of Dr. and Mrs. J. A. Nixon, 7, Lansdown-place, Clifton, Bristol, aged 4 years and 8 months.

MONTEITH.—On 22nd March, at 7, South-street, St. Andrews, Margaret Du Boulay Evans, beloved wife of W. B. R. Monteith, F.R.C.S. Ed.

REDDING.—*On March 18th, at Guy's Hospital, John Magnus* Redding, F.R.C.S. Eng., of Portland-place, W., aged 41.

VERCOE.—On March 22nd, suddenly, Richard Herbert Vercoe, B.A., M.R.C.S., L.R.C.P., D.P.H., Medical Officer of Health for the Borough of Chelmsford, in his 46th year.

WHITMORE.—On March 19th, William Beach Whitmore, M.B. Lond., of Thurloe-square, South Kensington, aged 83.

WILLIAMS.—On March 22nd, after a few hours illness, Raymond Pearse, only and dearly loved son of T. Pearse Williams, M.D., M.R.C.P., and Madge Williams, of 62, Leith Mansions, W.9, aged 8½ years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

Notes, Comments, and Abstra

HEALTH AND CLEANLINESS.

Dame Louise McIlroy, speaking at a luncheon give the Health and Cleanliness Council on March 19th, that it was impossible to make people moral by A Parliament, but at least it was possible to make clean. The root of all the excellent work in the welfare campaign was cleanliness; it had led to a redu of infant mortality by almost half the figure at whi had stood a few years ago. She urged all her heare join the campaign against long skirts, lest, sweepin floor like their Victorian grandmothers, women sl again help to disseminate dirt and disease. In mate work many women were still the victims of puer septicæmia, and sepsis was due to matter out of plac dirt. We should pin our faith not to antiseptics bu the cleansing properties of soap and water, and to protective mechanisms of the human organism.

Dr. G. F. Buchan, chairman of the Council, in repl to Dame Louise, said that health and cleanliness indissolubly associated. The basis of all rules for prevention of disease and the preservation of health cleanliness; sanitation aimed at making and keepin towns and houses clean. One of the attributes of be was cleanliness, and just as the æsthetic pleasure Romans took in their baths led them to provide an exce water-supply, so a wholesome vanity and the satisfa inherent in a sense of cleanliness might lead to valu reforms in our own day. It was necessary to stimul public consciousness of cleanliness. The most dange forms of dirt were bacteria; they were constantly dis inated by our fellow men and ourselves, and frequent l could help to prevent the spread of infection. The d rate from typhoid had been reduced enormously by impr sanitation during the last 50 years, by means of whic now enjoyed a clean water-supply. Public swimming b were often a source of infection; no person should such baths without previously washing thoroughly soap and water. Persons with discharges from ear eyes should be forbidden to use them.

A HOSPITAL IN THE ARCTIC.

THE Archdeacon of the Arctic, the Ven. A. L. Flem is trying to raise money to establish a hospital at Harbour, Baffin Land, at the eastern side of the distri Franklin. It was hoped that enough money migh raised to endow a bed in this hospital, to be dedicate "the memory of Sir John Franklin and his compan Sir John Richardson, Sir George Back, Lieutenant Ken &c.," but the number of surviving relatives is too few them to provide the necessary sum.

The fate of the *Erebus* and *Terror* expedition (184 overshadows the results of Sir John Franklin's ea explorations (1819–22 and 1925–27) that it is forgo what important additions they made to the map of Can The former "barren lands" of the first explorers have a continually increasing population of miners, traders, plane and railway employees, as well as settlers with families. Transport is facilitated by air or steamb even in winter communication is carried on by airpla The inhabitants of some of these regions will benefit by Lake Harbour Hospital. North-Western Canada is vided with a hospital at Aklarvik, Mackenzie River, the nursing staff for North-Eastern Canada have volunte and are ready to go as soon as there a building for to work in. Cheques may be made payable to the Ar Hospital Fund," and sent to Miss Gell, Harewood Ho Keyhaven, Milford-on-Sea, Hants.

OFFICIAL YEAR BOOK OF LEARNED SOCIETI

FOR 46 years past Messrs. Charles Griffin and Co. l have compiled from official sources a record of the w done in science, literature, and art during the prece twelvemonth, and have issued it in the Year Book of Scientific and Learned Societies of Great Britain and Irel The present volume is dated 1929 on the cover (althou might fairly be imprinted 1930); it contains 410 pages well printed and indexed, and is issued at 18s. The pub lisher's threat to limit the scope of the year-book by inser lists not of papers read but only those which are publis by the societies in question, which was to have taken ef this year, has been again postponed; but unless their ap for more general support is answered it seems that 47th volume will be issued in the less complete form. publisher sees in this one more illustration of the tend of the times to work less and play more, and we hope foreboding will be disappointed. The volume is a useful one for reference, and should be on the shelve every public library.